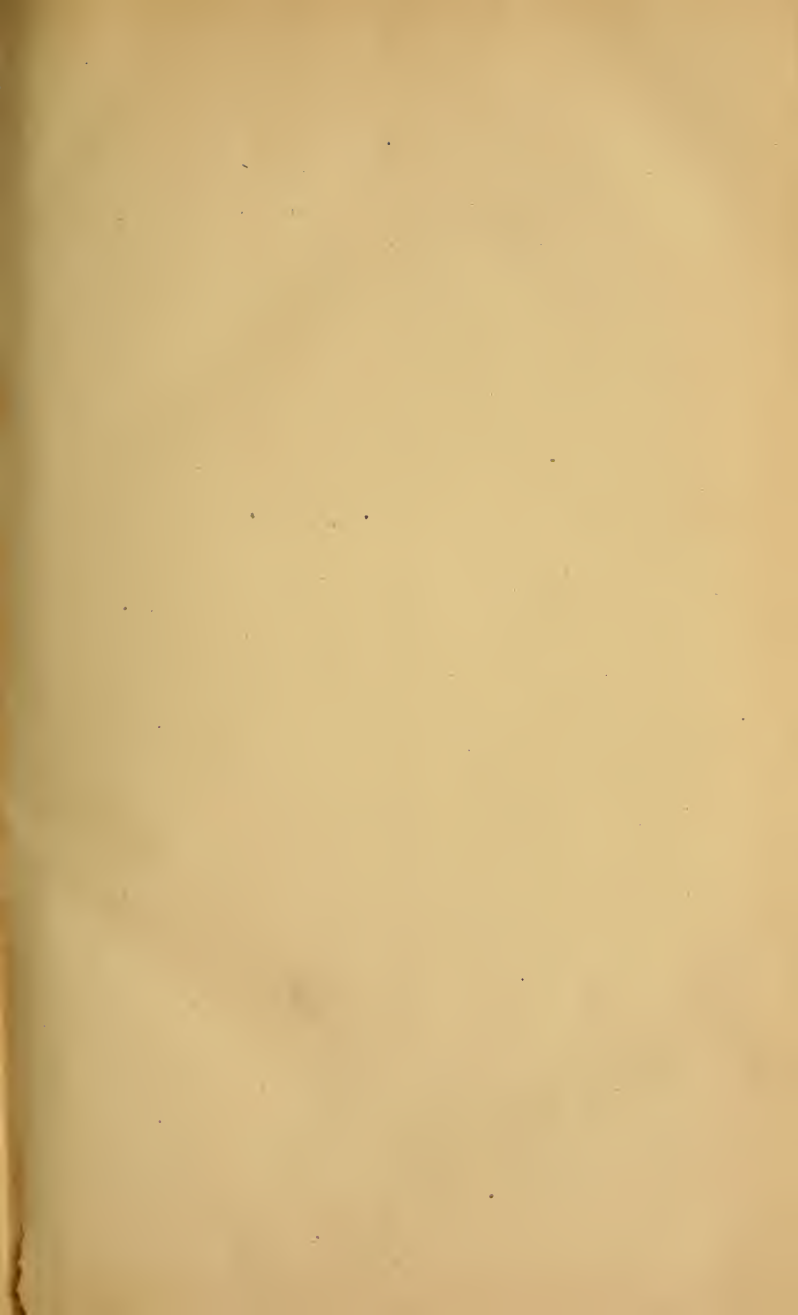


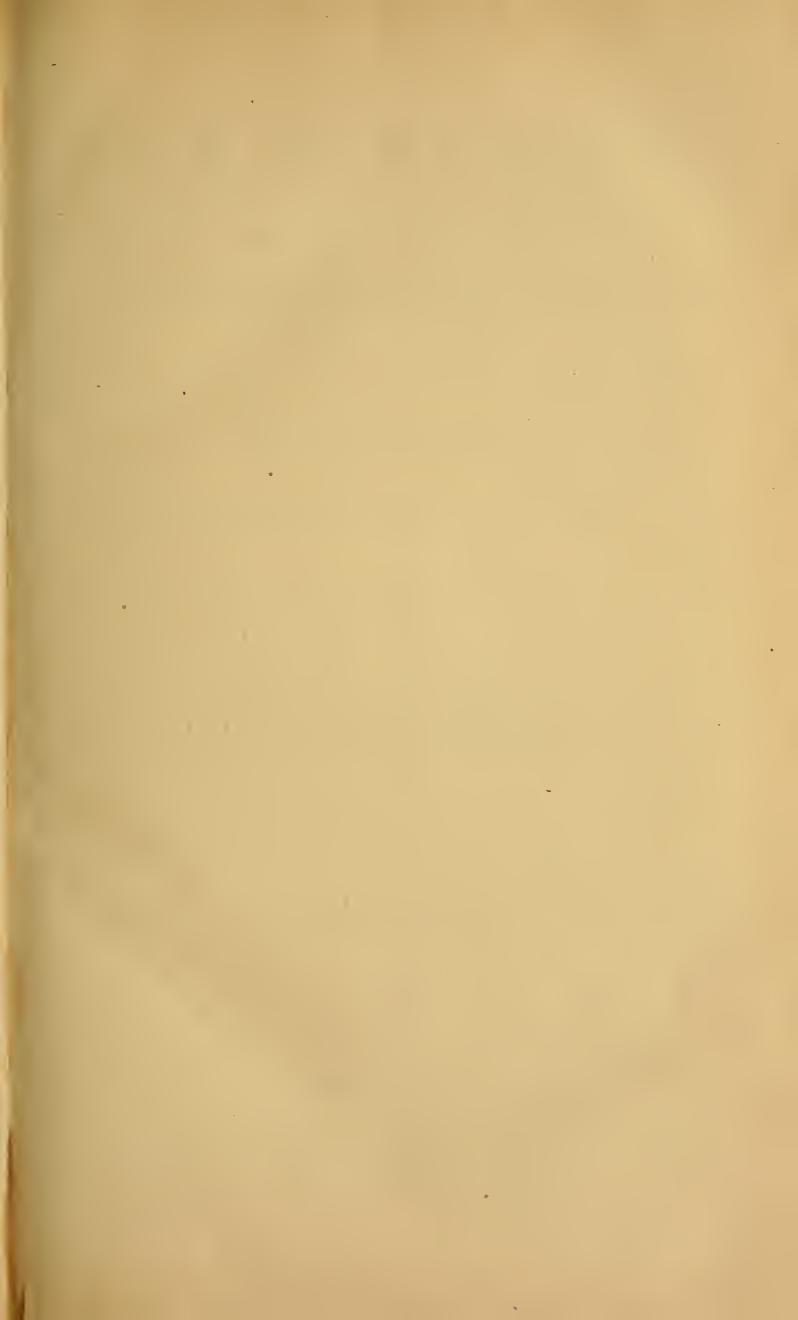
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NEW REMEDIES:

PHARMACEUTICALLY AND THERAPEUTICALLY CONSIDERED.

FOURTH EDITION,

WITH EXTENSIVE MODIFICATIONS AND ADDITIONS.

BY

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PHILADELPHIA:

LEA AND BLANCHARD.

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BARRINGTON AND HASWELL,
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P R E F A C E

TO THE FOURTH EDITION.

SINCE the publication of the third edition of this work in 1841, the Pharmacopœia of the United States has appeared under the revision of Professors Wood and Bache and the Author. This has rendered it necessary to modify somewhat the nomenclature, and, to a certain extent, the arrangement of the "New Remedies."

The Author has likewise endeavoured to embody all the new information of a therapeutical or pharmaceutical character, contained in the different scientific journals, as well as in the *ex professo* works on Materia Medica and Pharmacy, that have been published since the appearance of the last edition. Farther and varied opportunities have necessarily occurred for testing the value of many of the agents, and of the methods for preparing them. The results of these observations have been introduced. The labour required to accomplish this has not been trifling: the large amount of matter added — seventy or eighty pages — and the numerous alterations that have been made can only be accurately appreciated, however, by a close examination. The chief recent works consulted have been those of Pereira,* Chris-

* The Elements of Materia Medica and Therapeutics. By Jonathan Pereira, M.D., F.R.S., and L.S., &c., &c. 2d edit. pp. 1926. Lond. 1842; and Amer. edit. by Dr. Carson. 2 vols. Philad. 1843.

tison,* Bouchardat,† and Lincke,‡ but others of a previous date have not been neglected.

The additional articles inserted in their proper places in the present edition are: — *Aluminæ Sales*, *Anthrakokali*, *Cannabis Indica*, *Corylus Rostrata*, *Ferri Citras*, *Ferri et Quiniæ Citras*, *Fucus Amylaceus*, *Fuligokali*, *Gentiana Chirayita*, *Juglans Regia*, *Matias*, *Paullinia* and *Platini Præparata*.

Since the article *Aluminæ Sales* was written, the sulphate of alumina — at the author's suggestion — has been subjected to numerous trials in the surgical wards of the Philadelphia Hospital, and has been found a valuable antiseptic and detergent to ulcers. The detailed results of the observations of the resident surgeons on this matter will be published by the author hereafter.

ROBLEY DUNGLISON.

Philadelphia, March 25, 1843.

* A Dispensatory, or Commentary on the Pharmacopœias of Great Britain; comprising the Natural History, Description, Chemistry, Pharmacy, Actions, Uses and Doses of the Articles of the Materia Medica. 8vo. pp. 978. Edinb. 1842.

† Annuaire de Thérapeutique, de Matière Médicale et de Pharmacie, contenant le résumé des travaux thérapeutiques publiés en 1840, et les formules des médicamens nouveaux, tels que le lactate de fer; l'écorce de tulipier, le monésia, le guarana, l'anthrakokali, et les préparations nouvelles d'aconitine, de pulsatile, de goudron, de seigle ergoté, &c. Paris, 1841.

Do. Do. pour 1841. Paris, 1842.

‡ Vollständiges Recept-Taschenbuch in alphabetischer Ordnung nebst Angabe der Wirkung und Anwendung sämtlicher gebräuchlichen Arzneimittel im Allgemeinen, und der Heilformeln im Besonderen, für praktische Aerzte, Wundärzte u. Apotheker. pp. 816, 913. Leipz. 1840-1.

P R E F A C E

TO THE FIRST AND SECOND EDITIONS.

THE information, concerning the remedies of more recent introduction, lies scattered in so many works, that it cannot be accessible to the mass of physicians. The author has, consequently, believed, that he would be rendering a service to the profession by concentrating the results of experience within reasonable limits, so that they may be readily available to all. The majority of the new agents — it will be found — have been furnished by modern chemistry; and their employment has been attended with this advantage, that — when properly prepared — they are not liable to uncertainty in their operation; whilst the various plants from which strychnia, emetia, quinia, &c., are obtained, are liable to irregularity of action, owing to faults in desiccation, to the season in which they are culled, &c., &c. — objections which cannot apply to the active principles when separated from them.

Owing to the difficulty of sifting the results of true from those of false observation, the author has esteemed it proper to give, as far as he was able, the recorded experience of all who have employed the remedies in question.

It need scarcely be said, that to make a correct observer and a good therapist, a knowledge of every department of medical science is demanded. Anatomy, physiology, pathology, and materia medica are, indeed, but introductory to the great object which the practitioner has in view — the alleviation and removal of suffering. Were it otherwise, it would be but necessary to institute empirical trials, in every case of disease, with various articles in and out of the received lists of the materia medica, and from such vague trials to endeavour to deduce what is termed “experience.”

The erroneous idea prevails too extensively, that every one is capable of profiting by observation, and that, therefore, all who have had the same amount of experience, must be equally capable of treating disease. Setting aside, however, the consideration of the differences that must necessarily result from the varied powers of individuals, it can scarcely be maintained, that he, whose attention has not been properly directed to the study of the preliminary branches, which have been enumerated, and whose mind has not been trained in tracing the relation between cause and effect, can ever duly profit by mere experience in that which has been properly termed “the most inductive of all sciences.”*

To treat disease methodically and effectively, the nature of the actions of the living tissues, in both the healthy and morbid conditions, must be correctly ap-

* Propterea sola experientia absque doctrinâ et ratione incerta est, et conjecturalis. Qui enim novit rhabarbarum purgare bilem, nescit tamen quando, quibus, et cui morbo prosit, nisi sit medicus doctus et peritus. *Primeros. De vulgi erroribus in medicinâ*, lib. i. cap. xl. Amstelod. 1639.

preciated; the effects, which the articles of the *materia medica* are capable of exerting under both those conditions, must be known from accurate observation, and not until then can the practitioner prescribe with any well-founded prospect of success. Numerous errors would be perpetrated, were we to profess, and to carry out such profession, that we are guided by experience only, unless that experience had been gained by a due consideration of all the physiological, pathological, and therapeutical bearings of the subject. In illustration of this, the well-known case, cited by Dr. Paris, in his *Life of Sir Humphry Davy*, may be adduced. The enthusiastic Beddoes having hypothetically inferred, that the inhalation of the nitrous oxide might be a specific for palsy, a patient was selected for trial, and placed under the care of Davy — at the time assistant to Beddoes. Before administering the gas, Davy thought of ascertaining the temperature of the body by the thermometer placed under the tongue. The paralytic, deeply impressed by Dr. Beddoes with the certainty of the success of the remedy, of which he knew nothing — soon after the thermometer was placed in his mouth, believing this to be the great curative agent — declared that he felt somewhat better. Nothing more was, therefore, done; and he was requested to return on the following day. The same form was then gone through with the same results; and, at the end of a fortnight, the sick man was dismissed cured, no agent of any kind having been employed except the thermometer.

Now, if the reasoning powers were not duly exerted, experience would obviously teach, as the result of this case, that the thermometer is an antiparalytic. The rational therapist is not, however, satisfied with this knowledge of the fact, for “fact it is.” He enquires into the mode in which the effect was induced, and he is not long in referring it to the influence exerted by the *moral* over the *physique*; and he classes the thermometer with Perkinism, animal magnetism, and their congenerous arts, — amongst articles that act chiefly through the new impressions, which they make on the senses.

It might seem to those who are unacquainted with medical history, that in periods approaching our own, no such illogical inferences could be deduced, and that it has been the custom with the profession for ages, to bestow all due caution and the most rational enquiry in the collection of facts. Such, however, is far from being the case. It is, indeed, humiliating to reflect on the credulity or faulty observation that has existed among nations, who have successfully cultivated many of the other branches of natural science. It ought scarcely to be credited, and yet it is nevertheless true, that the *aqua spermatis ranarum*, or “water of frog’s spawn,” was to be found not very long ago in the *Pharmacopœia* of Sardinia; and the *aqua hirundinum cum castoreo*, or “water of swallows with castor,” in those of Manheim and Wirtemberg. The latter preparation is directed to be made as follows: — Take of *young swallows bruised in a mortar*, forty; rue, two handfuls; castor, one ounce; white wine, three pints. This disgusting preparation was given in hysteria and epilepsy. Again; the *bufones exsiccati*, or “dried toads,” were in the *Pharmacopœias* of Spain and Wirtemberg, — having been formerly administered in powder, as a diuretic, in dropsy. In another work,* the author has cited many examples as strange as those instanced, and it would be easy to enumerate still more.

In a recent French journal, and in an article by M. Ricord — the distinguished physician to the Venereal Hospital of Paris — we have an example of the pertinacity with which ancient prepossessions and inculcations adhere to us, and how difficult it is to think and to act according to the unbiased suggestions of our own observation and reflection. In the treatment of blennorrhagic epididymitis, or swelled testicle from gonorrhœa, M. Ricord recommends compression to be made by the means of the “sparadrap,” or plaster of Vigo with mercury. The history of this plaster is singular. Although still in the *Pharmacopœia* of Paris, it resembles its

* General Therapeutics, p. 55. Philad. 1836. [See, also, his *General Therapeutics and Mat. Medica*, i. 52. Philad. 1843.]

prototypes but in name. In the *Pharmacopœia* of Wirtemberg, it is directed to be formed of *living frogs* and *living earthworms*, boiled with various inert and by us rejected herbs in white wine and vinegar, — the decoction being strained, and added to olive oil, litharge, oil of bayberries, turpentine, yellow wax, olibanum, euphorbium, and liquid storax, all melted together.

Yet, it is scarcely possible to conceive, that the frog's spawn could have been supposed to yield a product, on distillation, differing from that of other animal substances, when subjected to the same process; that the swallows — in the preparation cited — added any thing to the antispasmodic virtues of the castor, or that the living frogs and earthworms exerted any efficacy in the *sparadrap de Vigo* — a plaster employed for compressing tumours, and for which purpose we use one of simple adhesive constituents. They have all been properly rejected from the lists of our medicinal agents, and are looked upon as irrational; yet we are compelled to infer from the fact of their having been received, in some countries, into official publications — into the *pharmacopœias*, which emanate from congregations of those of our profession, who are esteemed learned by education and by practice — that they were originally admitted under the sanction of fancied experience.

In the darker periods of medical history, monstrous and revolting polypharmaceutical preparations were introduced, and nothing but the blindest devotion to authority or to established custom could have occasioned their retention. It is not long since the *Theriac* of *Andromachus* — itself but a modification of the *antidotum Mithridatum* — was dismissed from the British *Pharmacopœias*. It consisted of seventy-two articles, and was a farrago — as Dr. Heberden observed — that had “no better title to the name of *Mithridates* than — as it so well resembles — the numerous undisciplined forces of a barbarous king, made up of a dissonant crowd collected from different countries, mighty in appearance, but in reality an ineffective multitude, that only hinder each other.” The *electuarium opiatum polypharmacum*, of the *Parisian codex* — the descendant of the old *theriac*, with even an additional number of ingredients — contains acrid substances, 5; astringent, 5; bitter, 22; indigenous aromatics, 10; umbelliferous aromatics, 7; balsams and resinous substances, 8; fetid ingredients, 6; narcotics, 1; earthy substances, 1; gummy or amylaceous, 4; saccharine, 3. Total, 72 — and one of these the *flesh of the viper*; a little more than a grain of opium — which may be regarded as a principal effective ingredient — being contained in a dram of the compound. Yet, when the question arose in the London College of Physicians, as to what should be the fate of this “many-headed monster,” and when it was proposed by Dr. Heberden, that it should be ejected from the *Pharmacopœia*, — on a division, it was found that there were *thirteen* votes for retaining and *fourteen* for rejecting it. Its ostracism was determined by a majority of *one* only, in a learned body, twenty-seven of whose members were present.

Such was the fate of a “heterogeneous farrago,” which, as Dr. Paris has remarked, “can be vindicated upon no principle of combination,” and yet enjoyed the confidence of physicians for ages — a confidence unquestionably founded, in their belief, on experience, but experience based upon defective observation, and consequently, on erroneous inferences — the results being consecutive rather than consequent, and bearing no relation whatever to the assigned cause.

Happily, more correct ideas are beginning to be entertained on the subject of true experience. It is now felt — to employ the language of a distinguished surgeon — Professor Liston — that the greatest number of well assorted facts on a particular subject constitutes experience, whether these facts have been culled in five years or in fifty. A better system, too, of observation generally prevails, so that we have discarded the absurd and revolting agents, that are still retained in the books of authority of some European countries. Much, however, remains to be done. The catalogue of the *Materia Medica* is yet overstocked, and the pruning knife has still to be applied to lop off many of the redundancies, which have been proved to be such, by the more accurate attention, that is daily paid to tracing

the due relation between cause and effect. "To purchase a clear and warrantable body of truth," as Sir Thomas Brown has well observed, "we must forget and part with much we know."

Every one will be compelled to admit, that it is the duty of the correct therapist to doubt the existence of qualities in any article until they have been adequately proved. When such is the case, no reasoning can set aside facts; but unless the evidence be overpowering, it is equally his duty to remain in doubt, especially should reflection suggest to him strong grounds for believing, that the number of observations has been insufficient, that they have not been properly made, or are inconsequential.

To enable the profession to form an accurate estimate of the value of remedies of more recent introduction, or of the older remedies whose use has been revived under novel applications, the present volume was undertaken by the author.

In Germany, several works exist on this subject, and that of Riecke — to which the author has repeatedly referred — served as a basis for many of the articles; his observations, however, do not come down farther than the year 1836. Some of the statements — especially in relation to the observations of certain of the German physicians — are given on Riecke's authority, for he has rarely appended references, by which the correctness of his assertions could be tested.*

It has been a great object with the author to furnish exact references to works in which farther information may be obtained, and the number of these will show, that he has devoted no small amount of time and attention to the subject. He has likewise added the results of his own experience in public and in private. The motto which he has selected — *prodesse quam conspici* — conveys, in epitome, his feelings. His sole object has been, "to be useful" — and if he has succeeded, the reward is ample.

ROBLEY DUNGLISON.

Philadelphia, October 15, 1839.

* Recently, a second and enlarged edition of Riecke's work has appeared; but the therapeutical additions to it are by no means as numerous as the author had expected to find them. He has, consequently, made but few extracts from it in the present edition. It is entitled, "Die neuern Arzneimittel, ihre physischen und chemischen Eigenschaften, Bereitungsweisen, Wirkungen auf den gesunden und kranken organismus, und therapeutische Benützung, Von Victor Adolf Riecke. Dr. Med., Mitglied des Vereins für Heilkunde in Preussen, u. s. w.; zweite, völlig umgearbeitete Auflage. Stuttgart, 1840."

NEW REMEDIES.

I. ACIDUM ACETICUM EMPYREUMATICUM.

SYNONYMES. Acidum Pyro-aceticum, A. Ligni pyro-oleosum, A. pyrolignosum, Acetum ligneum, Pyroligneous, and Pyrolignic acid.

French. Acide pyro-acétique, A. pyrolignique, A. pyroligneux, Vinaigre de bois.

German. Brenzliche oder brandige Holssäure; Holzsäure; Holzessig.

Pyroligneous acid, although brought much into notice — revived as it were — in recent times, is by no means the product of those times exclusively. The cedria, with which the Egyptians embalmed the bodies of the dead, it is presumed, was identical with it. Pliny recommends cedria, or the oil of tar, got from the cedar, in toothach,* and Galen unites with him.† The virtues of pyroligneous acid are often also referred to by Boerhaave.‡

METHOD OF PREPARING.

Pyroligneous acid is prepared in chemical laboratories by the dry distillation of wood, especially of hard wood, which is placed in an iron retort heated to redness. First of all, there passes over a light brown or greenish fluid, which contains some empyreumatic oil; to this succeeds the pyroligneous acid, which is formed during distillation. If the distillation be continued, more empyreumatic oil passes over, and lastly tar.

The chief constituent of pyroligneous acid is vinegar, which can be deprived of its empyreumatic constituents by rectification

* Hist. Nat. xxxiv. 11.

† De Simpl. Medic. Facult. lib. vii. See Cormack on Creosote, p. 59. Edinburgh, 1836; or the American edit. in Dunglison's American Medical Library.

‡ Riecke, Die neuern Arzneimittel. u. s. w. S. 6. Stuttgart, 1837.

with fine porous animal charcoal. Besides vinegar, it contains empyreumatic oil (*pyrelain*); empyreumatic resin (*pyrretin*), a peculiar matter containing azote, and similar to an extract (an empyreumatic extract), and spirit of tar (*spiritus pyrolignicus*). Of late years, Reichenbach has discovered in it a new substance, creasote,* which seems to be the most important ingredient, its medicinal efficacy appearing to be dependent upon that substance.

Impure pyroligneous acid is of a brownish colour, and of an acid smoky smell and taste. This is the preparation which is generally used externally; but, by chemical means, the acid may be purified so as to furnish the *acidum aceticum empyreumaticum rectificatum*. This differs from the impure pyroligneous acid in containing less empyreumatic resin and extract, and creasote. The London College, again, prepare from it a stronger acid, the *acidum aceticum fortius*, which is extremely volatile and pungent, and is used as a revellent.

EFFECTS ON THE ECONOMY IN HEALTH.

From experiments instituted on animals, it would appear, that the administration of pyroligneous acid in large doses occasions vomiting of a considerable quantity of a frothy fluid, having a strong odour of the acid; tremors of the limbs, convulsions, tetanus, protrusion of the eyes, insensibility, paralysis of the limbs, dyspnoea, croupy cough, hoarseness, &c. The death of the animal supervenes with symptoms of suffocation, and the fatal termination is often rapidly induced. Inspection after death exhibits manifest venous congestion in the brain, spinal marrow, lungs, liver, and spleen, and in the right side of the heart, — with, at times, inflammation of the stomach. According to Berres, it occasions marked narcotic effects. In by no means considerable doses, he found it to cause violent pain in the stomach and bowels, nausea and vomiting, general weakness, heaviness, vertigo, convulsions, and even death, without exhibiting any decided effect upon the vascular system. In smaller doses, it is said to produce a sensation of burning in the stomach, and after a time to quicken the pulse, and augment the cutaneous and renal depurations. Others — and the best observers, we think — deny it any narcotic properties.†

As an antiseptic, its efficacy is undoubted, and this has been long known. Creasote is, doubtless, a main agent in producing this result; and wherever the administration of creasote is indicated, the use of pyroligneous acid may be proper.

* See the article Creasote.

† Richter's *Specielle Therapie*. S. 255, Berlin, 1828.

EFFECTS ON THE ECONOMY IN DISEASE.

Possessed of the properties described above, pyroligneous acid was at once suggested in cases of *gangrene* and *sphacelus*, in which it was successfully used, as well as in *cachectic conditions* brought on by the misuse of mercury, and in *herpetic, flabby, fungous, and sloughing ulcers*, in *porrigo*, and in *toothach* produced by caries—the acid being dropped upon cotton and applied to the hollow tooth. In most of these cases, it was generally exhibited both internally and externally. Numerous experiments have been made with it in various affections by different observers; but its use has been more especially extolled in cases of *gangrene*, in which it corrects fætor, and promotes the separation of the dead parts.* The physicians of the Berlin Charité experimented with it in cases of *sloughing gangrenous sores* with such success, that they pronounced it an antiseptic of the highest order.† Besides the cases mentioned, it has been advised in *excoriated nipples*, mixed with white of egg;‡ in *cancerous* and *scrophulous affections*, in *cancrem oris*, in *caries of the bones*, and as a gargle in *scarlet fever*. It has, moreover, been recommended by Buchanan§ in *deafness* caused by deficient secretion of the cerumen of the ear, and in *discharges of an offensive character from the meatus auditorius, as well as from other outlets*; in *chronic inflammation of the tarsal edges of the eyelids*, and in *scabies*. In *gastromalacia* it has been recommended by Pitschaft|| and Teufel;¶ in *phthisis* by Harless, and in *dropsy, diarrhæa, putrid nervous fevers, &c.*, by Ampach;** yet, as was before remarked, it is rarely employed internally; indeed, both externally and internally, it has been greatly supplanted by creasote.

MODE OF ADMINISTRATION.

The inequality in the strength of the preparation renders it difficult to fix upon any precise dose. Of the impure pyroligneous acid, Sachs administered from five to thirty drops, three or four times a day, in simple or aromatic water.

* Dr. T. Y. Simons, in *American Journal of the Medical Sciences*, vol. v.

† Riecke, *Op. cit.* S. 9.

‡ Dr. Bursharat, in *Gazette Médicale*, and *Amer. Journ. of the Medical Sciences*, Feb. 1833, p. 503.

§ *Illustrations of Acoustic Surgery*, Lond. 1825.

|| *Med. Chirurg. Zeitung*, No. 7, 1825.

¶ *Annal. für die gesammte Heilkund. unter der Redact. d. Mitglied. der Badensch. Sanitätsk.* 2ter Jahrg. 1825.

** *Rust's Magazin*, B. xvi. H. 2. S. 353, and *Richter, Op. cit.* B. x. S. 257, Berlin, 1828.

Externally, it is applied both in a pure and dilute state ; in the former case to ulcers, by means of a pencil, several times in the day. It is generally diluted with simple water ; but in cases of *cancrum oris*, sugared water has commonly formed the diluent. It is also applied at times in the way of *cataplasm*. As a *wash* in porrigo, and as an *injection*, it may be diluted with six or eight parts of water ; as a *collyrium*, the proportion may be one part of the acid to twelve of water, and it may be employed, of about the same strength, as a *gargle*.

Heim has recommended the following application in *cancrum oris*.

Mel acidi acetici empyreumatici.

Honey of pyroligneous acid.

R. Acid. acet. empyreum. crud. f.℥iss.

Mellis rosæ, ℥j. M.

To be applied by means of a pencil.

Buchanan advises the following form of injection in cases of *purulent discharges from the meatus auditorius*.

Injectio acidi acetici empyreumatici.

Injection of pyroligneous acid.

R. Acid. acetic. empyreum. f.℥ij.

Aquæ destillatæ, f.℥vj. M.

Fiat injectio bis die utenda.

The following drops he recommends in cases where *the cerumen is deficient* in quantity.

Guttæ acidi acetici empyreumatici.

Drops of pyroligneous acid.

R. Acidi acet. empyreum. crud.

Olei. terebinth. rectific.

Sp. ætheris sulphur. comp. aa. partes æquales. M.

Two drops of this compound are to be dropped every night into the meatus auditorius.

Cataplasma acidi acetici empyreumatici.*Cataplasma of pyroligneous acid.*R. Furfur. $\frac{1}{2}$ ss.Pulv. sem. lin. $\frac{3}{4}$ j. M. bene et adde

Acid. acetic. empyreum crud. q. s. ut fiat cataplasma.

To be applied in cases of *foul ulcers*.**Linimentum acidi acetici empyreumatici.***Liniment of pyroligneous acid.*R. Acid. acet. empyreum. $\frac{3}{4}$ ss.Myroxyl. $\frac{3}{4}$ j.

Vitell. ovi, q. s. ut fiat linimentum.

To be applied on lint three times a day to *sloughs* and *ulcers*.**Collutorium acidi acetici empyreumatici.***Mouth-wash of pyroligneous acid.*R. Acid. acet. empyreum. rectific. f. $\frac{3}{4}$ ss.Aquæ cinnamomi f. $\frac{3}{4}$ iv.Syrup. mori, f. $\frac{3}{4}$ j. M.

Dr. Phöbus advises this as a wash for the mouth in cases of *cancrum oris*. It should be kept in a glass vessel covered with black paper to prevent decomposition.

II. ACIDUM HYDROCYANICUM.

SYNONYMES. Acidum Prussicum, Acidum Borussicum, A. Zooticum, A. Zootinicum, Hydrocyanic, Prussic, Cyanohydric or Cyanhydric Acid.

French. Acide Hydrocyanique, Acide Prussique.

German. Blausäure, Wasserstoffblausäure, Hydrocyansäure, Cyanwasserstoffsäure.

This acid can scarcely be looked upon as new: yet it is only in recent times that its application to pathological conditions has been well appreciated. It was discovered by Scheele, in 1780; but its

preparation in a state of purity, and its exact chemical constitution, were not understood until Gay-Lussac published the results of his investigations on the subject in the year 1815.*

METHOD OF PREPARING.

The three chief modes for preparing hydrocyanic acid, at one time received into the pharmacopœias, were those of Scheele, Gay-Lussac, and Vauquelin; the *first* of which was adopted by the framers of the United States' Pharmacopœia of 1820, and by those of Belgium, Paris, and Ferrara; the *second*, by the Pharmacopœias of Paris and Ferrara; and the *third*, by those of Belgium, Paris, and the United States. — (Edition of 1830.)

1. *Scheele's Method*.—Take of *Prussian blue*, 128 parts; *Red oxide of mercury*, 64 parts; *Distilled water*, 105 parts. Boil for a quarter of an hour, constantly shaking; strain, filter, and wash the residuum with *Boiling water*, 128 parts. Mix the two liquids together; introduce them into a flask, and add, *Porphyrised iron filings*, 96 parts; *Sulphuric acid* (66°), 24 parts: diluted with *Distilled water*, 24 parts. Shake the mixture, and keep the flask for an hour in cold water; pour the decanted liquor into a tubulated retort placed in a sand bath, to the neck of which is attached an adapter that passes into a tubulated receiver, whence a curved tube issues that passes into a flask filled with water; lute the apparatus; cover the receiver with wet rags; raise the heat until the liquid boils, and until there have passed into the receiver — 192 parts. Add to this liquid, of *Carbonate of lime*, 8 parts. Distil again, and draw off 128 parts, which must be kept in a bottle covered with black paper.

This process of Scheele always affords an acid mixed with a variable quantity of water.

2. *Gay-Lussac's Method*.—Take *Cyanuret of mercury*, at pleasure. Introduce it into a tubulated retort, the neck of which is furnished with a wide tube of glass filled with broken marble and chloride of calcium, which tube communicates, through a smaller one, with a bell glass surrounded by a freezing mixture.

Pour on *muriatic acid* sufficient to rise above the cyanuret to the height of a finger; heat gradually and moderately, and receive the condensed product into the bell glass.

The acid, obtained in this way, is anhydrous, and of the specific gravity .700.

* *Annales de Chimie*, tom. lxxvii. p. 128, and tom. xcvi. p. 136.

3. *Vauquelin's Method*.—Take of *Cyanuret of mercury*, 1 part; *Distilled water*, 8 parts. Pass a current of *sulpho-hydric acid gas* into the solution, until the gas is in excess; pour into the liquid pulverised *subcarbonate of lead* in sufficient quantity to remove the excess of *sulpho-hydric acid*; shake the mixture constantly, and when it has no longer the smell of putrid eggs, and ceases to blacken paper impregnated with acetate of lead, filter and preserve it carefully.

The product of this operation has been considered to approximate to the average density of the acid of Scheele.*

The variable density of the acid prepared after Scheele's method has prevented it from being generally used in medicine. The acid of Gay-Lussac is most commonly employed; but as its degree of concentration renders it dangerous, it is diluted with distilled water. Robiquet has proposed to bring its density to .900, by adding two parts of water to it. Thus reduced, it resembles the acid of Scheele, with the advantage, that there is a constant and known ratio between the pure or anhydrous acid, and the quantity of water united with it. Magendie adds to it six times its bulk, or eight and a half times its weight of distilled water, and calls the mixture *Acide prussique médicinal*,† *Medicinal prussic or Medicinal hydrocyanic acid*. Others have advised the employment of a mixture of three parts of water, and one part of acid, under the name of *Acide hydrocyanique au quart*, or "Hydrocyanic acid of quarter strength."‡

Dr. Bache asserts, that he had the process (Proust's or Vauquelin's) of the United States' Pharmacopœia (1830) repeated, when he found the acid obtained to have the specific gravity .998.

In the last edition of the Pharmacopœia of the United States (1842), the following form was introduced. It is essentially that of the London Pharmacopœia.

Take of *Ferrocyanuret of potassium*, ℥ij .; *Sulphuric acid*, ℥iss .; *Distilled water*, a sufficient quantity. Mix the acid with four fluid ounces of distilled water, and pour the mixture, when cool, into a glass retort. To this add the Ferrocyanuret of potassium, previously dissolved in ten fluid ounces of distilled water. Pour eight fluid ounces of distilled water into a cooled receiver, and, having attached this to the retort, distil, by means of a sand bath, with a moderate heat, six fluid ounces. Lastly, add to

* See Notes on Hydrocyanic acid, by Dr. R. E. Griffith, in *Philad. Journ. of Pharmacy*, iv. 17. Philad. 1833; also, Pereira, *Elements of Materia Medica*, 2d edit. i. 429. Lond. 1842. The *Dispensatory of the United States of America*, by Drs. Wood and Bache, 4th edit. p. 748. Philad. 1839, and Mr. David Stewart, *Maryland Medical and Surgical Journal*, April, 1840, p. 264.

† *Formulaire pour la préparation etc. de plusieurs nouveaux médicaments*.

‡ *Pharmacopée Universelle*, par Jourdan, i. 31. Paris, 1828.

the product five fluid ounces of distilled water, or as much as may be sufficient to render the hydrocyanic acid of such a strength, that 12.7 grains of nitrate of silver, dissolved in distilled water, may be accurately saturated by 100 grains of the acid.

When hydrocyanic acid is wanted for immediate use, the following formula is recommended : —Take of *Cyanuret of silver*, fifty grains and a half; *Muriatic acid*, forty-one grains; *Distilled water*, a fluid ounce. Mix the muriatic acid with the distilled water, add the cyanuret of silver, and shake the whole in a well-stopped vial. When the insoluble matter has subsided, pour off the clear liquor and keep it for use.

No matter how prepared, hydrocyanic acid should be kept in well-stopped bottles from which the light is excluded.

The characters that hydrocyanic acid should possess, according to the forms last given, are as follows : — It is colourless, of a peculiar odour, and wholly volatilizable by heat. One hundred grains of it produce, with solution of nitrate of silver, a white precipitate, which, when washed and dried, weighs ten grains, and is readily dissolved by boiling nitric acid. The acid of the Pharmacopœia of the United States contains two *per cent.* of pure anhydrous acid.*

EFFECTS ON THE ECONOMY IN HEALTH.

Hydrocyanic acid is usually classed amongst the narcotic poisons,† yet there is reason for believing, that its ordinary effects are purely sedative. Whilst the agents belonging to the class of narcotics produce, first of all, excitation in the organic actions, followed sooner or later, when the agent is in sufficient dose, by signs of sedation, this acid would seem to occasion the latter results only.

It is the most powerful of our poisons, producing, in an adequate dose, the fatal result so suddenly, that the animal experimented upon can scarcely be removed from the lap of the experimenter before all signs of life are extinct. This rapidity of action is unfavourable to the idea, that the acid acts through the mass of blood, and favours the view of those who believe, that the impression is made immediately on the nerves of the part with which it is placed in contact, or on the nerves that are distributed to the lining membrane of the bloodvessels, as suggested by Messrs. Addison and Morgan.‡ It seems to us, however, that

* Pharmacopœia of the United States, p. 59. Philadelphia, 1842.

† Christison's Treatise on Poisons, 3d edit. Edinb. 1836.

‡ An Essay on the Operation of Poisonous Agents upon the Living Body. Lond. 1829.

the same objection applies to the explanation of these gentlemen as to that which ascribes the effects to the poison being taken into the blood — that the fatal result is often too sudden for us to presume, that it has entered the bloodvessels; unless we esteem it an agent possessed of powerfully penetrating properties. In very large doses, the sensibility of the whole nervous system becomes annihilated almost with the rapidity of lightning.

A female, who was deceived by the odour of a solution of hydrocyanic acid in alcohol, drank a small vialful and died in two minutes, as if struck with apoplexy. A strong healthy man, thirty-six years of age, being detected in thieving, swallowed a small vialful of the acid, staggered a few steps, and fell dead. Four or five minutes afterwards, the physician who was called found him lifeless, without the slightest trace of pulse or respiration. In a few minutes, convulsive expirations were observed, but no indications of returning life: the face was sunken and livid; the hands and feet deadly cold; the forehead and face cold and dry; and the eyes half open and glassy.*

Dr. Damason† relates the case of a druggist, who had some hydrocyanic acid in a vial with a ground stopper, and, as it had been prepared almost three months, thinking that it was decomposed, he opened the vial, and applied it to his nose to ascertain whether the acid retained any smell; he instantly fell down, and remained for half an hour without giving the slightest signs of life; but finally recovered after an illness of several days.

Many experiments have been made on animals with this acid. A drop, introduced into the bill or anus of a sparrow, induced death in from one to two minutes, preceded by convulsions. Even holding the bill over a vial filled with the acid proved fatal. A duck was destroyed by fourteen drops. Twenty drops introduced into the stomach of a rabbit killed it in three minutes. When a few drops were injected into the jugular vein, death supervened still sooner. A small dog, to which two drops had been given, experienced shortness of breath, staggered, fell, passed its urine repeatedly, vomited twice, and afterwards seemed quite well. The same animal took, five hours later, eight drops, and fell into a tetanic, comatose condition, but recovered in half an hour. More severe but not fatal effects resulted from sixteen drops. Thirty to forty drops administered to dogs and cats, produced violent convulsions and death, in from six to fifteen minutes.

The experiments of Emmert and Coullon seem to have shown that the action of hydrocyanic acid is more violent when it is

* Hufeland, *Journal der practisch. Heilkund.* Band. xl. St. 1, S. 85 — 92, and Osann, in *Art. Blausäure*, in *Encyc. Wörterb. der Medicinischen Wissenschaft.* Band. v. S. 528. Berlin, 1830.

† *Journal de Chimie Médicale.* Juin, 1831.

injected into the jugular vein, or inhaled in a concentrated form ; less so when injected into the rectum. In the case of a horse, into whose jugular it was injected, death occurred in twenty-one minutes. When placed in contact with the dura mater, or with nerves, no striking phenomena were perceptible. [?] This fact was confirmed by Viborg.* On the other hand, when received into a wound in its concentrated state, it acts most violently. Scharring, who broke a glass containing the acid, and received some of it into the wound produced thereby, died in an hour after the accident.

It is not easy to deduce comparative results from the statements of different experimenters, inasmuch as we are ignorant of the precise strength of the acid employed. A French physician made some experiments on the uncertainty of the strength of the medicinal acid ; and found, that he could swallow a whole ounce of one sample, and a drachm of a stronger sample, without sustaining any injury ; but on trying some, which had been recently prepared by Vauquelin, he was immediately taken ill, and narrowly escaped with his life.† Dr. Pereira‡ once caused the instantaneous death of a rabbit by applying its nose to a receiver filled with the vapour of the pure acid : the animal died without a struggle. A drop of the pure acid of Gay-Lussac, placed in the throat of the most vigorous dog, caused it to fall dead after two or three hurried respirations.§

We have already alluded to the effect of the acid when dropped upon the conjunctiva — a mucous surface, and therefore possessed of highly absorbing powers : but it cannot be placed with impunity in contact with surfaces, which, owing to their being covered with cuticle, do not readily absorb. Orfila|| states, that a professor of Vienna, having prepared a pure and concentrated acid, spread a certain quantity of it on his naked arm, and died a short time afterwards. Dr. Christison,¶ however, says this was probably a mistake. On repeating some of the experiments, he** found, that a single drop, weighing scarcely a third of a grain, dropped into the mouth of a rabbit, killed it in eighty-three seconds, and began to act in sixty-three seconds ; that three drops, weighing four-fifths of a grain, in like manner killed a strong cat in thirty seconds, and began to act in ten ; that

* Osann, loc. cit. S. 580.

† Revue Médicale, xvii. 265, and Christison on Poisons, 3d Edit. p. 690, Edinb. 1836.

‡ Elements of Mat. Med. &c., 2d edit. i. 437, Lond. 1842.

§ Magendie, in Annales de Chimie et de Physique, vi. 347, and Formulary.

|| Toxicologie.

¶ Op. cit. p. 707.

** Op. cit. p. 694. See also, Dr. Geoghegan, in Dublin Medical Journal, for 1835, and Pereira, Op. cit. p. 242.

another was affected by the same dose in five, and died in forty seconds; that four drops, weighing a grain and a fifth, did not affect a rabbit for twenty seconds, but killed it in ten seconds more; and that twenty-five grains, corresponding with an ounce and a half of medicinal acid, began to act on a rabbit, as soon as it was poured into its mouth, and killed it outright in ten seconds at farthest. Three drops, projected into the eye, acted on a cat in twenty seconds, and killed it in twenty more; and the same quantity, dropped on a fresh wound in the loins, acted in forty-five, and proved fatal in one hundred and five, seconds.

When given in rather too strong a dose, or — if in proper doses — at too short intervals, it produces headach, and vertigo, which go off, however, in a few minutes: when inhaled, even if diluted with atmospheric air, it causes vomiting, prostration, pains in the back part of the head, and great diminution of the arterial pulsations. In a more concentrated state, the effects are more rapidly fatal than in any other form of administration. M. Robert found that when a bird, a rabbit, a cat, and two dogs, were made to breathe air saturated with its vapour, the first and second died in one second; the cat in two seconds; one dog in five, and the other in ten seconds.*

With regard to the parts of the economy that are primarily acted upon by the hydrocyanic acid, there can be but little doubt in designating the nervous system.† In no other way can we readily explain the extreme rapidity of its action in fatal cases. When once mixed with the blood, however, out of the body, it altogether changes the character of that fluid, and opposes its coagulation.‡ Some of the German writers§ have endeavoured to indicate three grades of its action on the economy. *First.* In moderate doses, long continued, it occasions a marked diminution in the action of the nervous and vascular systems; vertigo; disposition to syncope; epistaxis as a consequence of thinness of the blood, and a disposition to putrid diseases.|| *Secondly.* In larger doses, the sedative effect of the acid on the spinal marrow, and the abdominal ganglia, is indicated by feelings of weakness, numbness, tremors, and other involuntary motions of the extremities, involuntary discharge of the urine and fæces, augmentation of the cutaneous and urinary depurations; palpitations, anxiety at the præcordia, weak pulse, and, according to some, headach, espe-

* Annales de Chimie, xcii. 59.

† Dr. Lonsdale, Edin. Med. and Surg. Journ., Jan. 1839, and Lond. Lan. June 15, 1839, p. 410.

‡ Magendie, Lectures on the Blood. Lect. xvii. in Lancet, for Jan. 26, 1839, p. 636. On its Action when injected into the Vessels; see Mr. Blake, in Edin. Med. and Surg. Journ. April, 1839, p. 339.

§ Richter, Specielle Therapie, Band. x. S. 280. Berlin, 1828; and Osann, loc. cit. S. 527.

|| Encyc. Wörterb. B. ii. S. 315.

cially in the back part of the head ; excoriation of the tongue and inner parts of the cheeks,* and salivation. This last symptom is given by Dr. Christison† on the authority of Drs. Macleod and Granville.‡ It has been suspected, however, that salivation, in these cases, was brought about by the use of an impure acid, containing probably a small quantity of the corrosive chloride of mercury, particularly if the acid had been prepared — according to the process of the Dublin College — with bichloruret of mercury, muriatic acid and water. Mercury is, indeed, asserted to have been actually discovered in the acid by Sylvester's test. *Thirdly.* In still larger doses, it induces violent affections of the spinal marrow, convulsions, trismus, opisthotonos, emprosthotonos, fainting, &c.

From the results of all his observations, Osann§ infers, that hydrocyanic acid acts dynamically on the nervous system, by diminishing, depressing, and annihilating its life ; and, through the nervous system, affecting the organs of vegetation or nutrition, and of hæmatisis ; — that it incontestably has a specific relation to the spinal marrow, the ganglions of the abdomen, and the dependent organs ; and hence it is, that, in comparison with other narcotic agents, it is less stupifying, whilst it influences more deeply the phenomena of vegetative or organic life. He properly remarks, however, that the inferences of Jörg,|| from his experiments, are apparently opposed to this view. Jörg considered its effects upon the brain to be excitant, and that it occasioned turgescence of that organ.

EFFECTS ON THE ECONOMY IN DISEASE.

From the effects produced by the hydrocyanic acid on the healthy body, we may infer the cases of disease in which it may be indicated. It is decidedly sedative, allaying nervous irritability and vascular action, and therefore adapted for all cases in which these are inordinately excited. Yet its power, as a medicinal agent, is not as great as was at one time presumed, and as is still presumed, by many. In some countries, too, it has found more favour than in others. In Italy, France and England, it has been more extensively used than in Germany ; yet in many of the Pharmacopœias of the last country it has been admitted into the list of officinal agents. The great objections that have been urged against it are — its danger, even in a small dose, if not carefully administered ; the difficulty of having it always of the same strength ; the

* Born, in Rust's Magazin, B. xiii. S. 282.

† Op. citat. p. 701.

‡ Lond. Med. and Phys. Journ. xlv. 359 and 363.

§ Loc. citat. S. 526.

|| Materialien zu einer künftigen Heilmittellehre. B. i. S. 53, 117.

impossibility of administering it undiluted, and the danger of giving too strong a dose in consequence of its rising to the surface of water. More than once the difference in the strength of the acid, prepared by different methods, would seem to have occasioned unfortunate results. Orfila,* mentions the case of a sick person, who had used for a length of time the hydrocyanic acid, in increasing doses, with advantage; when, being compelled to send her prescription to another apothecary, the acid he employed was so strong as to produce death, with all the symptoms of poisoning by hydrocyanic acid. For these and other reasons, Riecke, L. W. Sachs, and Osann greatly prefer the *Aqua laurocerasi* and the *Aqua amygdalarum amararum* (q. v.), which, although in other respects not less objectionable, are far less dangerous.†

Possessed of the powerful sedative agency, which has been described, it is not to be wondered at, that hydrocyanic acid should have been prescribed in a multitude of cases; and, as constantly happens, that unsuccessful trials, suggested by the merest empiricism, should have been made with it.

It is rarely employed in *fevers*, — intermittent, remittent, or continued. By many it has been esteemed beneficial in hectic; but here its agency must be doubtful.‡

In *inflammations*, especially when accompanied with marked erethism of the nervous system, it has been greatly extolled, and, next to bloodletting, has been regarded by many as one of our most valuable antiphlogistics. The followers of the contra-stimulant school esteem it as one of their most efficacious contra-stimulants.

In the *acute inflammations* of internal organs it has been highly recommended by the Italian physicians, Borda and Brera; in *thoracic inflammation*, after bloodletting, in conjunction with tartarised antimony and similar sedative agents; and by others in *enteritis*, *metritis*, and *nephritis*, and in *active hemorrhages*.

In *chronic inflammations* it has been advised by Granville, Magendie, Heller, Elwert, Behr, Roch, &c., especially in *chronic catarrh*, *bronchitis*, and *hooping cough*. In the last affection it is conceived by Dr. A. T. Thomson§ to be “the sheet anchor of the practitioner;” and by Dr. Roe|| to possess a “specific” (?) power. In warm weather he thinks it will cure almost any case of simple hooping cough in a short time; in all seasons it will

* Toxicologie.

† Die neuen Arzneimittel, u. s. w. von V. A. Riecke, S. 5. Stuttgart, 1837; Osann, loc. citat. and Encyclopäd. Wörterb. ii. 315.

‡ See the author's General Therapeutics and Materia Medica, ii. 180, Philad. 1843.

§ Elements of Mat. Med. and Therapeutics, i. 435. Lond. 1832.

|| A Treatise on the Nature and Treatment of Hooping Cough, &c., p. 10. London, 1838.

abridge its duration, and in almost every instance, where it does not cure, it will, at least, materially relieve the severity of the cough.

In *pulmonary consumption* it has been recommended by Granville, Magendie, S. G. Morton,* Fantonetti,† and others, particularly where there is any inflammatory or spasmodic complication; but others, as Neumann, Weitsch, Sir James Clark, Andral,‡ Forget,§ and, we may add, ourselves, have given it in these very cases without any success. By some, indeed, it has been affirmed, that its administration in phthisis is to be adopted with caution, as in many cases instead of allaying, it appears to have increased, the cough and fever, diminished the expectoration, and occasioned a sense of suffocation:¶ it has been, moreover, asserted, that its depressing and destructive agency has acted injuriously on the organism of the consumptive.¶¶

In *chronic nervous diseases*, especially when of a spasmodic character — as in *spasmodic affections of the heart* — even when organic, hydrocyanic acid has been advised as a soothing agent, as well as in *spasmodic asthma*; in the *sense of suffocation* that accompanies hydrothorax and other affections; and in *spasmodic dysphagia*.

Its efficacy, too, has been marked, according to Elliotson,** in various *neuropathic disorders of the stomach*, especially in those in which pain at the epigastrium was the leading symptom, — in every form, indeed, of *gastrodynia*; and in *painful affections of the bowels*, of a similar character — *enteralgia* — it has been found useful by Dr. Pereira.††

In *enlargement of the heart* it was found by Heller to diminish the force and frequency of the pulsations, and in this way to afford essential relief. In an old person, labouring under *anasarca accompanied by great pain in the breast*, Rees observed, after the administration of Vauquelin's acid, great diuresis, with the removal of the dropsy and its concomitant symptoms.‡‡

In the *asthma pulverulentum* of the Germans, (*Staubasthma*),

* Illustrations of Pulmonary Consumption, p. 131, Philad. 1834.

† Gazette des Hôpitaux, Fév. 19, 1839.

‡ Bulletin Général de Thérapeutique, Mars, 1840.

§ L'Expérience, Nov. 14, 1839; and Amer. Med. Intel., Sept. 1., 1840, p. 170.

¶ Schneider, Med. Prakt. Adversarien am Krankenbette, Erste Liefer, S. 62, referred to by Osann.

¶¶ Siebergundi, in Hufeland's Journal der pract. Heilkund. B. liii., St. 6. S. 15.

** On the Efficacy of Hydrocyanic or Prussic Acid in Affections of the Stomach, &c. Lond. 1820.

†† Op. citat., p. 443.

‡‡ Osann, Op. cit., and Harless Rhein-Westphäl. Jahrbuch. Bd. x., St. 1, S. 82.

that is, in the variety to which millers, bakers, grinders and others are liable, Creutswicher is said to have found it highly serviceable.*

Its efficacy has not been so marked in *epilepsy*, *chorea*, and kindred affections; yet it has been strongly recommended in *tetanus*. Trevezant ordered it in a case of traumatic tetanus, after opium had been given in vain, in the dose of from two to twelve drops with favourable results.† On the other hand, Klein gave it in a similar case, with no other apparent effect than that of rendering death more easy.‡ It has likewise been advised in *spasmodic pains of the uterus*.

Yet, although it would seem to be soothing and antispasmodic in many cases of erethism, Grindel and Osann§ consider it by no means adapted for the radical cure of spasmodic diseases.

In violent *neuralgia*, especially in an impressible condition of the vascular system, in *nervous cephalalgia*, *hemicrania*, *tic-douloureux*, and in *gouty* and *rheumatic sciatica* it has been extolled. Dr. E. S. Bonnet,|| of Charleston, treated successfully some cases of *facial neuralgia*, of great severity, by applying it externally in the form of the distilled water of *prunus laurocerasus*. It is proper, however, to remark, that in two of the three cases described, belladonna was employed in combination. The mode of applying it was by lotion, composed of ʒiv. of the *laurel water*, one ounce of *sulphuric ether*, alone, or with half a dram or a dram of *extract of belladonna*. With this lotion the affected parts, previously covered with carded cotton or cotton wadding, were kept constantly wet.

It has likewise been recommended by Elliotson¶ in the cure of *vomiting*, not dependent upon inflammation.

These are the chief cases in which its internal use has been prescribed.

It has been employed *externally* in the following cases. As a soothing agent in *severe pain*; — for example, in *toothach* from caries; one to two drops, according to Elwert, being put into the hollow tooth. Krimer applied it in a dilute state to *painful wounds*; and it has been injected with advantage into *fistulæ*.

In *neuralgia*, the application of a cataplasm of belladonna and hydrocyanic acid has been advised by some.

In *cutaneous affections*, of an itching, painful or inflammatory nature, it has been used with much success. In five cases of

* Rust's Magazin, Bd. xxii. S. 335.

† Froriep's Notizen, Bd. xiv. No. 15. S. 324.

‡ Heidelberger Klinische Annalen, Bd. ii. S. 112.

§ Loc. citat., S. 535.

|| North American Archives of Medical and Surgical Science, April, 1835.

¶ Lond. Med. Gazette, 1831. and Amer. Journ. of Med. Sciences, May, 1831, p. 242.

obstinate *herpes*, Schneider used a solution of the acid in alcohol : in similar cases Dr. A. T. Thomson, besides the use of a purgative of calomel and colocynth, applied compresses to the parts wetted with the dilute acid. In two cases of *impetigo*, the local application completely allayed the distressing and intolerable itching and tingling, after other external applications, and the internal use of anodynes, had been of no avail. The discharge was diminished and rendered milder : alterative doses of mercury, combined with sarsaparilla, formed the internal treatment.* Dr. Thomson found the lotion useful, in combination with small doses of corrosive chloride of mercury, in *acne rosacea*, and in several *other cutaneous affections*.

In *herpes*, Magendie advises a lotion of hydrocyanic acid and lettuce water in the proportions mentioned hereafter.

The acid has likewise been used, in the form of glyster, in *scirrhus of the pylorus*, in the strength of six drops of Vauquelin's acid to eight ounces of water ;† and in *uterine pain from scirrhus*, injections of the acid, combined with infusion of belladonna, have been employed with advantage.

In *ophthalmia*, especially of the serophulous kind, with engorgement of the conjunctiva, it has been advised by Elwert‡ — two drops of the acid being mixed with a dram of water, and a little dropped frequently into the eye ; and it has been given in the active inflammatory stage of *blennorrhœa*.§

Lastly, when a portion of *tænia* has protruded from the rectum, — with the view of destroying it, it has been advised by Cagnola, Gelnecke, and others, that hydrocyanic acid should be applied to it.||

Such are the principal affections in which the hydrocyanic acid has been used. The author has often employed it internally in many of the cases recommended, especially in *painful affections accompanied by great nervous impressibility*, and in consumption, but he has not had sufficient reason to place it high in rank amongst medicinal agents.¶ He has certainly had no evidence, that it can cure consumption when not beyond its first stage, as remarked by Magendie.** If the practitioner will bear in mind

* London Medical and Physical Journal, Feb. 1822 ; and the author's edit. of Magendie's Formulary, p. 112. Lond. 1824. Philad. 1825.

† Bernd, in Rust's Magazin. Bd. xiii., S. 273.

‡ Ibid. B. xiii., S. 182.

§ Ibid. B. xxii., S. 228.

|| Osann, Op. cit., and Gerson and Julius, Magaz. d. Ausländischen Literatur der gesamt. Heilkund. B. ii., 177. Also, Hufeland und Osann's Journal der prakt. Heilkund. Bd. lviii., St. 6, S. 122. See also Richter, Op. cit., S. 313.

¶ See, also, Becquerel, Gazette Médicale de Paris, Jan. 13, 1840.

** The author's edit. of the Formulary, p. 108.

the effects, which the acid is capable of inducing upon healthy man, when the dose is carried to the requisite extent, he will have no difficulty in deciding upon the cases in which its agency may be appropriate. If not a true sedative, it is the nearest approach to one, in the catalogue of the *Materia Medica*, and therefore its employment is clearly indicated in all diseases in which there is much erethism, — administered alone or along with other appropriate agents.

MODE OF ADMINISTRATION.

After the remarks that have been made on the varying strength of the hydrocyanic acid, according to the particular form by which it may have been prepared, it is hardly necessary to say, that the physician must be acquainted with the character of the acid he prescribes. The ordinary dose of the acid of the *Pharmacopœia* of the United States is a drop, given three times a day in a little sugared water: it must be borne in mind, however, that the specific gravity of the acid is less than that of water, and hence the necessity of dropping the quantity of acid at the time of using it, rather than forming a mixture with a larger quantity of the acid, which will certainly rise to the surface, if the mixture be put to one side: and unless the vial is shaken, a much larger dose may be administered than was intended. It must also be recollected, that the acid loses its strength by keeping. Magendie remarks,* that when left to itself in a close vessel, it sometimes becomes decomposed in less than an hour, and that it rarely preserves its integrity for more than a fortnight.

The substances, that are incompatible with it in the same prescription, are most metallic oxides, particularly those of mercury and antimony, nitrate of silver, salts of iron, sulphurets, mineral acids and chlorine.

The proper plan is to begin with a small dose and to augment it carefully until some effect is induced, but if any of the signs — mentioned above as indicating the supervention of the sedative effects of the acid — should supervene, it ought to be discontinued. There is no distinct evidence of its being a cumulative poison.†

Magendie, it has been seen, uses the hydrocyanic acid of Gay-Lussac, diluted with 8.5 times its weight of water; and this mixture he denominates *medicinal prussic acid*.

The following are forms in which the acid may be administered.

* Op. citat. p. 104.

† Christison, *Dispensatory*, p. 28. Edinb. 1842.

Mistura acidi hydrocyanici.*Mixture of hydrocyanic acid.**Mélange pectoral.*

- R. Acidi hydrocyanici medicinalis, ℥j.
 Aquæ destillatæ, ℥j.
 Sacchari albi, ℥iiss. M.

A dessert spoonful of this is directed to be taken every morning and evening at bed time—the dose being gradually increased to six or eight spoonfuls in the 24 hours. *Magendie.*

- R. Acidi hydrocyanici (Scheele's) ℥xij.
 Vin. antimon., f.℥j.
 Tinct. opii camphoratæ, f.℥iiss.
 Misturæ camphoræ, f.℥vijss. Fiat mistura.

Dose—In *hooping cough*; a table spoonful every four hours for a delicate boy four years old, to be given in some warm drink. The child to remain in a warm room, and to live upon light pudding and broth. *Roe.*

- R. Acidi hydrocyanici (Scheele's), ℥xx.
 Vin. antimon., f.℥iiss.
 Vini ipecacuanhæ, f.℥iiss.
 Aquæ, f.℥xiiij. Fiat mistura.

Dose—A small spoonful every two hours for a healthy looking female child, five years of age. *Roe.*

Syrupus acidi hydrocyanici.*Syrup of hydrocyanic acid.*

- R. Syrupi purificat. ℥j.
 Acidi hydrocyanici medicinalis, ℥j. M.

This syrup may be added to common pectoral mixtures, and used as other syrups are. *Magendie.*

Lotio acidi hydrocyanici.

Lotion of hydrocyanic acid.

R. Acidi hydrocyanici, f.℥iv.
 Spiritus vini rectific. f.℥j.
 Aquæ destillat. f.℥xss. M.

This was the lotion employed by Professor Thomson in the cases of *impetigo*.

The following was used by Schneider, in herpes.

R. Acidi hydrocyanici, f.℥iss.
 Spirit. vini. rectific. f.℥vi. M.

And in the same cases, Magendie employed the subjoined formula.

R. Acidi hydrocyanici, ℥ij.
 Aquæ lactucæ, ℥ij. M.

The distilled water of the garden lettuce probably contains nothing to recommend it over common distilled water.

Dr. Joy* advises the following lotion, in *acne* and *impetigo*, to correct itching ; and in *ulcerated cancer* to diminish pain.

R. Acid. hydrocyan. dil., f.℥i — ℥iv.
 Decoct. malvæ, Oj. M.

The bottle should be shaken before each application.

All these formulæ are objectionable for the reasons before assigned ; and it is consequently better to drop the acid at the time of using it, taking care that it has not lost its properties.

* Tweedie's Libr. of Med., v. 288, Lond. 1840.

III. ACIDUM LACTIS.

SYNONYMES. Acidum Lacticum, Lactic Acid, Acid of Milk.

French. Acide Lactique.

German. Milchsäure.

This acid is recommended as a therapeutical agent by Magendie.*

METHOD OF PREPARING.

Lactic acid may be obtained either from *milk* or from the *juice of the red beet*. In the latter case, the juice is put in a situation the temperature of which is between 77° and 86° Fah. After the lapse of a few days, a commotion is observed in the mass, which is known under the name "viscous fermentation," (*fermentation visqueuse*,) and hydrogen and carburetted hydrogen are evolved in considerable quantity. When the mass has become fluid again, and the fermentation has ended, which generally requires about two months, it is evaporated to the consistence of syrup; the whole then becomes traversed by a multitude of mannitic crystals, which — when washed with a small quantity of water, and dried — are entirely pure. The mass, moreover, contains a saccharine matter, which affords all the signs of the sugar of the grape. The product of the evaporation is next treated with *alcohol*; this dissolves the lactic acid, and precipitates several substances, that have not yet been examined. The alcoholic extract is then dissolved in water, which occasions a fresh precipitation. The liquid is now saturated with *carbonate of zinc*, and by this means a fresh precipitation is effected, more copious than the preceding. By concentration, the lactate of zinc shoots into crystals, which are collected and heated in water, to which *animal charcoal*, previously washed in muriatic acid, has been added: the fluid is then filtered, and the lactate of zinc is deposited in perfectly white crystals: these are washed in *boiling alcohol*, in which they are insoluble; afterwards they are treated with *baryta*, and then with *sulphuric acid*, which separates the lactic acid, which is finally concentrated *in vacuo*.†

* Formulaire pour la préparation et l'emploi de plusieurs nouveaux médicaments, &c. Edit. 9ème. Paris, 1836.

† Gay-Lussac and Pelouze, Annales de Chimie et de Physique, Avril, 1833. (Tom. lii. 410.)

Mitscherlich* gives the following process for preparing it pure. *Lactate of lead*, formed in the usual way, is decomposed by *sulphate of zinc*; the sulphate of lead is separated, and the lactate of zinc crystallised by evaporation; this is at first yellow, but by repeated crystallisations, it is obtained of a pure white. The solution of this lactate is decomposed by *pure baryta*; the oxide of zinc separated, and the lactate of baryta, which is in solution, is decomposed by *sulphuric acid*, and the fluid evaporated; this yields a clear, colourless, syrupy, not volatile acid, which is decomposed, and leaves a residue of charcoal, when heated at a sufficiently high temperature.

Milk, which has been suffered to ferment for a long while, and is treated in the same way, affords lactic acid. Corriol has likewise detected it in an aqueous infusion of the *nux vomica*.

When concentrated *in vacuo* until it parts with no more water, lactic acid is a colourless liquid, of syrupy consistence; its specific gravity being about 1.215. It is inodorous, but of a very sour taste, similar to that of the strongest vegetable acids. When exposed to the air, it attracts moisture. Water and alcohol dissolve it in all proportions. One of its most striking properties, which is of especial interest to the physician, is, that it quickly dissolves phosphate of lime, especially that which is contained in bones.

EFFECTS ON THE ECONOMY.

As lactic acid was conceived to play a part amongst the juices, which effect the solution of the food in the stomach, Magendie thought it may be given with advantage in cases of *dyspepsia* produced by simple debility of the digestive apparatus; and his experiments afforded him very encouraging results. According to Liebig,† however, no lactic acid is formed in the stomach in a state of health; but in certain diseases, there are produced from the starch, sugar, &c., of the food, lactic acid and mucilage.

In consequence of the facility with which lactic acid dissolves phosphate of lime, it has been suggested, whether it might not be administered with advantage in cases of *white gravel*, or, in other words, of *phosphatic depositions from the urine*. Magendie has not yet been able to institute experiments on this matter. At the time when the edition of his *Formulary*, to which we have referred, was published, he had commenced some clinical experiments with lactate of potassa, and lactate of soda, but without any results worthy of being communicated to

* Report to British Association, 2d meeting, and Philad. Journ. of Pharmacy, vi. 83. Philad. 1834-5.

† Animal Chemistry, edited by Gregory and Webster, p. 107, Cambridge, 1842.

the profession. He recommends these salts, however, to the attention of physicians.

MODE OF ADMINISTRATION.

Magendie gives lactic acid either in the form of lemonade or of lozenges.

Potus acidi lactis.

Lemonade of lactic acid.

R. Acid. lact. liquid. ℥j. ad ℥iv.
Aquæ, ℥ij.
Syrupi, ℥ij. M.

Pastilli acidi lactis.

Lozenges of lactic acid.

R. Acid. lact. pur. ℥ij.
Sacch. pulv. ℥j.
Gum. tragac. q. s.
Ol. æther. vanigl. gtt. iv. M.

Make into Lozenges weighing half a dram each. Let the Lozenges be kept in a well closed vessel. Of these, from two to six may be taken in the 24 hours without any evil consequences.

IV. ACIDUM TANNICUM.

SYNONYMES. Acidum Quercitannicum, Tanninum Purum, Tannicum, Principium Adstringens, P. Scytodephicum, Tannin, Tannic acid.

French. Acide Tannique.

German. Tannin, Gerbestoff, Gerbsäure.

This article, in its pure state, has been subjected to experiment of late years only.

METHOD OF PREPARING.

According to Buchner,* tannic acid should be prepared for medical use in the following manner.

* Repertorium, B.xxxiv. H. 3; also, A. W. Buchner, *Neueste Entdeckung. über die Gerbsäure*, u. s. w. Frankf. 1833, and Dierbach, in *Heidelberger Klinische Annalen*, B. x. H. 3, S. 339, Heidelb. 1834.

For the process of M. Duval, see *Annal. de Chimie et de Physique*, and *Amer. Journ. of Pharm.* July, 1841, p. 171.

From eight to twelve parts of *hot water* must be poured on one part of powdered *galls*, and the mixture be allowed to digest for an hour, frequently agitating it. The infusion must then be filtered, and the residue be again treated in the same manner with a little hot water. The different infusions, which generally pass through the filter turbid, must be mixed together, and a little *dilute sulphuric acid* be added by drops, constantly shaking the mixture so long as any precipitate of tannic acid follows. The acid is deposited very soon in this way, in a collected yellowish-white, gelatiniform mass, which by the influence of air gradually assumes a brown colour.

After the fluid is poured off, the residue is washed twice with cold water *acidulated with sulphuric acid*; *carbonate of baryta*, or *carbonate of potassa*, is then added to it in small portions, carefully shaking the mixture, until there is no farther effervescence, and until a portion of the mass dissolved in water and tested by chloride of barium affords no more evidence of the presence of sulphuric acid. The yet moist mass is then put into a retort with *alcohol* of about *ninety per cent.*, which is added repeatedly in small portions; the alcohol is made to boil, to dissolve the tannic acid and separate it from the sulphate of baryta or sulphate of lime; the alcoholic solution is then poured off clear, and by a gentle heat evaporated to dryness.

The following form for its preparation is given in the last edition of the Pharmacopœia of the United States (1842). Take of *Galls*, in powder, *Sulphuric ether*, each a sufficient quantity. Put into a glass adapter, loosely closed at its lower end with carded cotton, sufficient powdered galls to fill about one half of it; and press the powder slightly. Then fit the adapter accurately to the mouth of a receiving vessel, fill it with the sulphuric ether, and close the upper orifice so as to prevent the escape of the ether by evaporation. The liquid which passes separates into two unequal portions, of which the lower is much smaller in quantity and much denser than the upper.

When the ether ceases to pass, pour fresh portions upon the galls, until the lower stratum of liquid in the receiver no longer increases. Then separate this from the upper, put it into a capsule, and evaporate with a moderate heat to dryness. Lastly, rub what remains into powder. The upper portion of liquid will yield by distillation a quantity of ether, which, when washed with water, may be employed in a subsequent operation.

Tannic acid, thus prepared, is of a yellowish-white colour; of a strongly astringent taste; very soluble in water, and less so in alcohol and in ether. It reddens litmus paper.*

* Pharm. of the United States, p. 63, Philad. 1842.

EFFECTS ON THE ECONOMY.

Tannic acid is a strong astringent,* which has hitherto been mainly used in *uterine hemorrhage*, and especially by the Italian physicians. Porta† was, perhaps, the first who tried it. He found it very efficacious in cases of uterine hemorrhage not dependent upon any organic mischief in the uterus. It exhibits its powers, according to him, even in small doses — as of two grains, and is well borne by the stomach. Ferrario‡ likewise administered it with advantage in the same affection, but he does not consider it adapted for cases in which either partial or general plethora, or local excitement of the uterus, or any organic disease, exists: it is indicated only where pure atony is present. He gives it in the form of powder or pill, in two grain doses, six times a day. The effect, according to him, is generally good: the hemorrhage diminishes and soon ceases, and, at the same time, the strength augments, and recovery succeeds, without any disturbance of the functions. Giadorow§ details two cases of *diabetes* cured by it, when given in combination with opium, as in the prescription at the end of this article. The first patient was cured in ten; the second in twelve days.

According to Ricci,|| tannic acid has frequently been employed in Italy both in *internal and external hemorrhages*. On the other hand, G. A. Richter,¶ affirms, that he has given it in *habitual metrorrhagia* without any advantage whatever. Within the last few years, M. Cavarra** has instituted many experiments on animals, as well as on himself, from which he concludes, that when tannic acid is placed in contact with certain parts of the living economy, it exerts upon them the same chemico-vital action which it does on an inert organic tissue, or, in other words, it tans them as it tans leather. "These parts," he says, "are the mucous membranes of the urethra, vagina, intestines, and lungs. The action of tannic acid appears to be, to cause such a condensation or contraction in them, that the glands with which they are studded no longer afford passage for the mucus which they secrete."

* See, on the action of this agent, Mitscherlich, *Medicinische Zeitung*, No. 43, 1838, and *Bullet. Général de Thérap.* Mars 30, 1837.

† Delpech, *Mémorial des Hôpitaux du Midi*, &c. Février, 1829, p. 51.

‡ *Annali universali di Medicina*, Gennajo, 1829.

§ *Annali universali di Medicina*, and *Gazette Médicale*, Sep. 15, 1832.

|| *Bulletin des Sciences Médicales*, Sept. 1828.

¶ *Arzneimittellehre*, Supplement, p. 60; also, Cavalier, in *Archiv. Générales*, xix. 589.

** *Bulletin de l'Académie Royale de Médecine*, Janvier, 1837; also, *Dun-glison's Medical Intelligencer*, Oct. 16, 1837, p. 258, and *Bulletin Général de Thérapeutique*, Mars 30, 1837.

M. Cavarra asserts, that he has proved these positions by numerous experiments and demonstrations. When tannic acid is taken internally, its immediate effect is constipation, by arresting the secretion from the mucous membrane. When it has reached the stomach, it is absorbed, and carried into the current of the circulation. There exists between this organ and the vagina, the urethra, and the lungs, no communication except through the circulatory system, and, consequently, the tannic acid — it is fair to presume — must be absorbed to cure *leucorrhœa*, *gonorrhœa*, and the most obstinate *chronic catarrhs*. M. Cavarra concludes, that of all the effects of tannic acid, two of the most surprising are, the cures operated by it in cases of *obstinate nervous coughs*, and the excellent action it exerts in *phthisis*. Farther experiments are, however, demanded before this last point can be admitted. From our knowledge of the properties of tannic acid, it is not easy to see how it — or any other astringent — can be of much service in the latter malady.

M. Amédée Latour* has highly extolled tannic acid for its efficacy in *hæmoptysis*. In one case, it completely succeeded when other remedies had failed; and in three cases of *hemorrhage* to a slighter degree, it was wholly successful. M. Charvet† has also recommended it in the *sweats of phthisis*. He gives it in the dose of from half a grain to a grain and a half, alone, or associated with opium, and generally at bed-time.

Hüter affirms, that tannic acid, prepared from dried galls, in the form of ointment or diluted with distilled water, is very serviceable in most cases of *Egyptian ophthalmia*. In the *hyperæmesis*, induced by ipecacuanha or emetia, it may be administered as an antidote.

According to the experiments of Magendie,‡ it is one of the substances that oppose the coagulation of the blood.

METHOD OF ADMINISTERING.

It may be given in the form of pill, or draught, or as a *lavage*, and in the dose of from a quarter of a grain to two grains, without producing any unpleasant constipation, but its effects must be observed with care.§

* Journal de Médecine et de Chirurg. Pratiq. Nov. 1839.

† Bulletin Général de Thérapeutique, Mai, 1840, and Encyclographie des Sciences Médicales, Juin, 1840.

‡ Lond. Lancet, Jan. 26, 1839, p. 636.

§ Cavarra, in Bulletin Général de Thérapeutique, Mars 30, 1837.

Vinum aromaticum cum acido tannico.

Aromatic wine with tannic acid.

- R. Vini aromat. f. ℥viiij.
 Acid. tannic. ℥ij. M.
- R. Vini aromat. f. ℥viiij.
 Acid. tannic. ℥ij.
 Ext. opii. purif. ℥ss. M.

Used as a local dressing to *chancres*.

Ricord.

The VINUM AROMATICUM of the French Codex, used by Ricord, is composed of four ounces of *aromatic herbs*, (rosemary, rue, sage, hyssop, lavender, absinthium, origanum, thyme, laurel leaves, red rose leaves, chamomile, melilotum, and elder,) digested in two pints of *red wine* for eight days.

Injectio acidi tannici.

Injection of tannic acid.

- R. Vin. rubr. f. ℥vj.
 Acid. tannic. gr. xviiij. M.

Used in chronic *blennorrhœa* or what is called an *old gleet*.
Ricord.

In the case of the female, the quantity of tannin may be doubled or still farther increased.

Pilulæ acidi tannici.

Pills of tannic acid.

- R. Acid. tannic. in pulv. gr. vj.
 Gum acac. in pulv. gr. xij.
 Sacchar. pulv. gr. lxxij.
 Syrup. q. s. ut fiat massa in pilulas pond. gr. iv. sing.

Dose. — One to four, morning and evening, where an astringent is needed.

Cavarra.

* La Lancette Française, No. 33, Paris, 1838, and Parker, Modern Treatment of Syphilitic Diseases, Dunglison's American Med. Library edit., p. 44. Philad. 1840.

Pulveres acidi tannici et opii.

Powders of tannic acid and opium.

R. Acid. tannic. ℥ij.

Pulv. opii. gr. ½. Misce et divide in pulveres tres.

Dose. — One, morning, noon, and night ; gradually increasing the quantity of tannin to four scruples daily. *Giadorow.*

Pomatum acidi tannici.

Pomatum of tannic acid.

(*Liparolé de tannin.*)

R. Adipis suill. ℥xij.

Acid. tannic. ℥ij.

Aquæ pur. f.℥ij.

Dissolve the tannin in the water, by triturating them in a glass mortar ; add the fat and mix.*

Béral.

Lotio acidi tannici.

Lotion of tannic acid.

(*Hydrolotif de tannin, pour l'urèthre.*)

R. Aquæ destillat. f.℥viij.

Acid. tannic. gr. xxxij. Solve.

Employed in *obstinate blennorrhœa.*

Béral.

* Bulletin Général de Thérapeutique, Janvier, 1838.

V. ACONITIA.

SYNONYMES. Aconitina, Aconita, Aconitium, Aconitine.

German. Akonitin.

This active principle, which was discovered by Peschier,* and by Brandes, has been recommended by Turnbull,† whose eulogies on the medical virtues of the natural order Ranunculaceæ are evidently overstrained.

MODE OF PREPARING.

Turnbull gives two processes ; the former being the more easy of manipulation ; the latter yielding a purer result, and on the whole being preferable.

A quantity of the fresh root of *Aconitum napellus*, being very carefully and cautiously dried, and reduced to powder, — one part of it by weight, and two parts by measure, of *strong alcohol*, are to be digested together at a gentle heat for seven days, and the tincture, whilst warm, is to be filtered. It must then be reduced to the consistence of an extract, by careful evaporation, at a low and well regulated temperature ; the object of this being to prevent the destruction or expulsion of the active principle, which would very probably ensue, if the temperature employed were higher than barely sufficient to carry off the alcohol. To the extract, thus prepared, *liquid ammonia* is to be added, drop by drop, and mixed well with it, to precipitate the alkaloid ; in this part of the process care must be taken that too much be not added, as in some instances the product appears to have been decomposed by inattention to this circumstance. It is not easy to give a precise rule as to the quantity ; but enough will have been added, if the extract exhales the odour of ammonia when stirred. The mass now consists of impure aconitia, mixed with a quantity of extractive, and other matters soluble in water, and it may be taken up either by *boiling alcohol*, or by *sulphuric ether* ; or the soluble matter may be removed by repeated washings with small quantities of cold water, which will leave the aconitia. This latter process, Turnbull says, is

* Trommsdorff's Journal der Pharmacie, v. 84.

† On the medical properties of the natural order Ranunculaceæ, and more particularly on the uses of *sabadilla* seeds, *delphinium staphysagria* and *aconitum napellus*, and their alkaloids, *veratria*, *sabadilline*, *delphinia* and *aconitine*, chap. iii. Lond. 1835.

the one he has generally employed, and it is performed by pouring a little water on the extract, and mixing them carefully together; then allowing the undissolved part to subside, pouring off the fluid, and repeating the operation as long as any soluble matter is taken up: a quantity of light brown or gray powder is left, which may be purified by subsequent solution in *alcohol*. This powder contains the active properties of the aconite, in a high degree of concentration.

The second process consists in dissolving the *alcoholic extract*, prepared as above, without the addition of the ammonia, in as much *cold water* as will take it up, and carefully decanting the solution from the insoluble part, and filtering it. To the filtered solution *liquid ammonia* is to be added, drop by drop, as long as any precipitation is occasioned. When the precipitate has subsided, the supernatant fluid must be carefully poured off, or drawn off by means of a syphon; and after the precipitate has been deprived of as much of the fluid as possible, it should be purified by a sufficient number of washings with small quantities of cold water, or, what is better, it may be dissolved in as much *alcohol* as will take it up, and the solution be thrown into *cold water*; the precipitate thus formed is to be carefully dried. The product obtained by this process is white.

The London College, in their Pharmacopœia, of 1836, give the following form:—Take of *aconite root*, dried and bruised, two pounds; *rectified spirit*, three gallons; *dilute sulphuric acid*, *solution of ammonia*, and *purified animal charcoal*, of each a sufficient quantity. Boil the aconite with a gallon of the spirit for an hour, in a retort with a receiver fitted to it. Pour off the liquor, and again boil the residue with another gallon of the spirit, and with the spirit recently distilled, and pour off the liquor also. Let the same be done a third time. Then press the aconite, and having mixed all the liquors and filtered them, distil the spirit. Evaporate the remainder to the proper consistence of an extract. Dissolve this in water and filter. Evaporate the solution with a gentle heat, so that it may thicken like syrup. To this add dilute sulphuric acid, mixed with distilled water sufficient to dissolve the aconitia. Next drop in solution of ammonia, and dissolve the aconitia which is thrown down in dilute sulphuric acid, mixed as before with water; then mix in the animal charcoal, occasionally shaking for a quarter of an hour. Lastly, filter; and having again dropped in solution of ammonia so as to precipitate the aconitia, wash and dry it.

Well prepared aconitia, according to Geiger, is a firm, colourless, and translucent mass; of a shining appearance, friable and inodorous: the taste is disagreeably bitter, leaving behind it an acrid sensation in the throat, but not corrosive or burning.

It does not dissolve readily in water ; at the ordinary temperature requiring one hundred and fifty parts thereof, but only fifty parts of boiling water. It is soluble in alcohol, and in ether. Tincture of iodine occasions in the solution a reddish-brown precipitate ; the tincture of galls a white one. It forms, with the acids, for the most part, salts that are not crystallisable, which readily dissolve both in water and alcohol.

EFFECTS ON THE ECONOMY.

The effects of aconitia appear to be essentially analogous to those of delphinia. A grain of the first of the two preparations described by Turnbull was dissolved in a dram of alcohol ; twenty drops of the solution put into the mouth of a guinea-pig occasioned death in a few minutes. Other experiments, too, have been performed, all of which demonstrate the extreme activity of the substance. If a grain or two of aconitia or veratria or delphinia be mixed with a little lard, or dissolved in a dram of alcohol, and a small quantity be rubbed on the skin, a sensation of heat and tingling is experienced after the friction has been persevered in for a minute or two. There is a slight difference, however, in the effects produced, and the resemblance is greatest between those of delphinia and aconitia.

When a small quantity of aconitia, says Turnbull, either made into an ointment, or dissolved in alcohol, is rubbed for a minute or two upon the skin, a sensation of heat and prickling is experienced ; to this succeeds a feeling of numbness and constriction in the part, as if a heavy weight were laid upon it, or as if the skin were drawn together by the powerful and involuntary contraction of the muscles beneath. This effect lasts from two or three to twelve or more hours, according to the quantity rubbed in. So small a portion as the one hundredth part of a grain has produced a sensation that has continued a whole day. A minute portion of it mixed with lard, and applied to the eye occasions contraction of the pupil according to Dr. Pereira, whilst Geiger and Hesse affirm that the aconitia which they obtained produced dilatation of the pupil. Dr. Pereira states, that the aconitia prepared by Mr. Morson of London is so powerful, that one-fiftieth of a grain has endangered the life of an individual. It is, he considers, the most virulent poison known, not excepting hydrocyanic acid.*

Whilst employing aconite itself in his clinical practice, Dr. Lombard,† of Geneva, tried its effects on animals, and chiefly in refer-

* Elements of Mat. Med. &c., 2d edit. ii. 1811. Lond. 1842.

† Gazette Médicale de Paris, Oct. 10, 1835.

ence to its action on the heart. The experiments were made on frogs, whose hearts beat with great regularity, and for a considerable time after the animal has been mutilated. The medicine was introduced into the stomach or applied locally to the heart, which was laid bare after the animal had been stupified by blows on the head. He found, that aconite employed internally rendered the pulsations less frequent, without irregularity, and consequently that it exerted a decidedly sedative effect on the heart; whence he infers, that it is a proper remedy in active diseases of the heart, and indeed in inflammatory affections in general, in which he exhibited it with success. In cases of poisoning by it, the contractions of the heart have been found diminished and almost suspended.* The homœopathsists regard it to be an energetic antiphlogistic.

The diseases, in which Turnbull chiefly employed aconitia externally, were of the *neuralgic kind*; but he used it as well in *gouty* and *rheumatic cases*, and its success, he remarks, fully answered his anticipations. He employs it either in the form of solution in alcohol, in the proportion of one or more grains to the dram, — or of ointment, made according to the following formula:

R. Aconitiæ, gr. ij.
 Alcohol. gtt. vj. Tere optimè et adde
 Adipis, ℥j. ut fiat unguentum.

The alcohol is added to prevent the aconitia from forming a thick compound with part of the lard, so as to render it difficult to make a proper ointment. In one case of *tic douloureux*, of extreme severity, as much as eight grains was prescribed in the ointment with the most marked benefit. The best mode of applying it is simply to rub a small portion of it over the whole seat of the affection, until the pain is either for the time removed, or until the full effect, described above, is induced on the cutaneous nerves; and the friction should be repeated three or four times, or more frequently, during the day, according to the effect on the disease; the proportion of the aconitia being increased at every second or third rubbing.

Turnbull found, in the case of the aconitia — as well as in that of *veratria*, and *delphinia* — that unless the friction occasioned a full development of the peculiar impressions caused by the aconitia when rubbed on the skin, no benefit whatever was to be looked for from its employment; and he observes, that if there be the slightest abrasion of the skin, an application of such

* Orfila, Toxicologie, ii. 221.

activity should not be resorted to ; and that it should be carefully kept from coming in contact with any of the mucous membranes.

Mr. F. C. Skey* details two cases which were cured by it. It was rubbed down into an ointment with lard, in the proportion of one grain of the former to one dram of the latter, and applied in a small quantity by the forefinger over the track of the painful nerve, and was gently rubbed or rather smeared over the surface for half a minute or longer, once or twice a day, according to the degree of pain.

Turnbull likewise advises the external application of an AMMONIATED EXTRACT OF ACONITE, which is made by evaporating very carefully, and at a low temperature, the tincture of the dried root of the plant, prepared as directed in the process for obtaining aconitia, to the consistence of an extract. To every dram of this, eight or ten drops of *liquor ammoniæ* should be added, and after the mixture has stood a short time in a very gentle heat, to drive off the excess of ammonia, it may be used in the form of an ointment, according to the following prescription :

Unguentum extracti aconiti ammoniati.

Ointment of ammoniated extract of aconite.

R Ext. aconit. ammon. ℥j.
Adipis. ℥iij. Misce ut fiat unguentum.

When this ointment is rubbed upon the skin, it occasions sensations in the parts similar to those produced by the aconitia ointment : they are, however, rather more pungent.

In less severe cases, Turnbull advises the simple saturated tincture of the dried roots, with or without the addition of a little ammonia. The external use of the tincture of aconite has been recommended in *neuralgia* and *chronic rheumatism* by Dr. Pereira† and Mr. Jos. Curtis.‡

The *alcoholic extract of aconite*—EXTRACTUM ACONITI ALCOHOLICUM—which is officinal in the last edition of the Pharmacopœia of the United States, 1842—has likewise been advised by

* London Med. Gaz. Nov. 5, 1836.

† Elements of Materia Medica, 2d edit. ii. 1808. Lond. 1842.

‡ Lond. Lancet, June 26, 1841.

Dr. Lombard, of Geneva,* in *articular rheumatism*. He gives it in doses of half a grain every two hours, and gradually augments the dose to six or nine grains in the same period.

A case of poisoning by five grains of this extract — from which, however, the patient recovered — has been published by M. E. L. Pereyra, of Bordeaux.†

VI. ACUPUNCTURA.

SYNONYMES. Acupuncture; Acupuncturation.

German. Die Akupunktur; der Nadelstich.

Although acupuncturation is really an ancient therapeutical agent, attention to it has been so much revived of late years, and its use has been so largely extended, that it may be looked upon as constituting one of the novelties of therapeutics.

It consists in the introduction of needles into different parts of the body with a view of removing or mitigating disease; and appears to have been entirely unknown to the Grecian, Roman, and Arabian physicians.‡ From the most ancient times, however, it has been in use with the Chinese and Japanese, by whom it was regarded as one of the most important of remedial agencies. By these people it was systematically taught on appropriate phantoms or *mannekins*, called *Tsoe-Bosi*, and the practice of the operation was permitted to those only who were able to pass a rigid examination thereon. In Europe, it was first known about 160 years ago, from the writings of a Dutch surgeon, Ten-Rhyne, who wrote in 1683;§ and attention was subsequently drawn to it by Kämpfer;|| but after this it was almost forgotten, until Berlioz, in 1816, drew attention to its employment. His example was soon followed by Bécларd,¶ Brétonneau,** Haime,†† Demours,‡‡ Sarlandière,§§ Pelletan, Ségalas, Dantu, Velpeau, Meyranx,||| Dance, in France; by Churchill, Scott,

* Gazette Médicale, Juin 28, 1834. See, also, Dr. Sigmond, in *Lancet* for August 5, 1837.

† La *Lancette Française*, No. 37, Mars 26, 1839.

‡ V. A. Riecke, *Die neuern Arzneimittel u. s. w.* S. 12, Stuttgart, 1837.

§ *Mantissa schematica de Acupuncturâ ad dissert. de Arthritide*. London, 1683.

|| *Aménitat. exotic. politico-physico-medic.* p. 583. Lemgov. 1712; and his *History of Japan*, vol. ii., Appendix, sect. 4, p. 34.

¶ *Mem. de la Société Médic. d'Emulation*, viii. 575.

** *Journal Universel des Sciences Méd.* xiii. 35. Paris, 1817.

†† *Journal Génér. de Médec.* tom. xiii., and *Journal Univers. des Sciences Médic.* tom. xiii. 1819.

‡‡ *Ibid.* tom. xv.

§§ *Mem. sur l'Electropuncture*. Paris, 1825.

||| *Archives Générales de Méd.* tom. vii. Paris, 1825.

Elliotson,* and others in England; by Friedrich,† Bernstein,‡ L. W. Sachs, Heyfelder, Michaelis,§ Gräfe,|| and others, in Germany; by Carraro,¶ Bergamaschi,** Bellini, and others, in Italy; and by Éwing,†† E. J. Coxe,‡‡ Bache,§§ and others, in this country.

M. Jules Cloquet had much to do in reviving its employment in his own country and elsewhere, by his treatise on the subject published at Paris, in 1826, where it was for a long period a fashionable article in the hospitals; so much so, it is affirmed, that attempts were even made to heal a fractured bone by it without the application of any appropriate apparatus! and at one time, it is said, the patients in one of the hospitals actually revolted against the *piqueurs médecins!*|||

MODE OF ADMINISTRATION.

In the operation of acupuncture, needles are employed, which are very fine, well polished and sharp pointed. They are usually from two to four inches long, the length being adapted to the depth it may be desired to make them penetrate. If steel needles are selected, they are heated to redness, and allowed to cool slowly, in order that they may be less brittle. At the blunt extremity of the needle, a head of lead, or sealing wax is attached to prevent it from being forced entirely into the body. This is the simplest method of acupuncture, and it is as effectual as any other. By various acupuncturists, needle-holders or handles of ivory have been devised, to some of which the needle is permanently attached. Perhaps the *porte-aiguille*, or 'needle-holder' recommended by Prof. F. Bache,¶¶ is as good as any that has been invented. The needle, with its *porte-aiguille*, consists of a handle with a steel socket to receive the end of the needle, which may be fixed securely, after having been inserted, by the pressure

* Med. Chir. Trans. xiii. 467. Lon. 1827; and art. Acupuncture, in Cyclop. Pract. Med. Lond. 1832.

† Translation of Churchill's work in German, p. 40.

‡ Hufeland's Journal, lxvii. Berlin, 1828.

§ Gräfe und Walther's Journal, B. v. St. 3. S. 552.

|| E. Gräfe, in art. Acupunctur. in Encyc. Wörterb. der medicinisch. Wissenschaft. B. i. S. 312. Berlin, 1828.

¶ Annali Universali d'Omodei, 1825.

** Ibid. 1826.

†† North Amer. Med. and Surg. Journal, ii. 77. Philad. 1826.

‡‡ Ibid. ii. 276. Philad. 1826.

§§ Ibid. i. 311. Philad. 1826; and art. Acupuncture, in Cyclop. of Pract. Med. i. 200. Philad. 1833.

||| Riecke, Op. cit. S. 13.

¶¶ Cyclop. p. 202.

of a small lateral screw. By this construction, the operator can at pleasure fix in the handle a needle of the length he may desire, and after inserting it he is enabled to detach the handle by relaxing the screw. After all, however, needles prepared in the simple manner mentioned above are adequate to every useful purpose.

Besides common steel needles, those of gold, silver, and platinum have been used, but it does not appear that one metal is preferable to another.

To introduce the needle, the skin is stretched, and the needle inserted by a movement of rotation performed in opposite directions, aided by gentle pressure. As a rule, the seat of pain will indicate the place where the needle should be introduced; but where the feelings of the patient do not point out the spot, it must be suggested by our knowledge of anatomy and physiology. From the experiments of Bécлар, Brétonneau, Ségalas, Dantu, Velpeau, and others, it would appear, that perforation of arteries, nerves, and even of important viscera with very fine needles has not been followed by any injurious results; yet, at times, accidents have been produced thereby; and, therefore, it may be laid down as a rule, that the greater nerves, and arteries of a certain size, should be avoided. Prudence would likewise suggest, that important viscera, as the heart, stomach, intestines, &c., should not be penetrated.

The number of needles to be used varies according to the extent of the affected parts. In the opinion of many experienced physicians, we ought not to be afraid of the number, but rather insert too many than too few, and not at too great a distance from each other.

The length of time, during which the needles should be suffered to remain in the part, differs; no fixed rule can be laid down. Some suffer them to remain for an hour and a half, or two hours; at times, a period of five minutes is sufficient. In other cases, they have been kept in for two or three days. It appears to be by no means settled what medicinal influence is exerted by their longer or shorter continuance in the parts.

EFFECTS ON THE ECONOMY.

Allusion has already been made to the impunity with which, in the generality of cases, acupuncture may be practised even on important organs.

As respects the nerves, Cloquet has seldom or never seen the puncture of them give rise to so much pain as to render it necessary to withdraw the needles; the pain was generally trifling and speedily passed away. He inserted needles into the brain and

spinal marrow, and into the crural nerve of a cat, without any evidence of severe suffering or of change of function. Similar experiments were made by E. Gräfe with the same results.* Nor was inconvenience found by Delaunay, Béclard and Cloquet to be sustained on puncturing the arteries and veins. A few drops of blood perhaps issued, but the flow was readily stopped by pressure with the finger. The slight ecchymosis, which, at times, supervened, disappeared rapidly of itself. In Gräfe's experiments, he never found much bleeding ensue, although he properly esteemed it advisable to keep clear of the nerves and blood-vessels, in order to avoid any unnecessary pain or mischief.

As regards the fasciæ and periosteum, Gräfe found, that the insertion of needles into them was always very painful, and he recommends, therefore, that the operation should be performed with care on those parts. Should, however, the needles be introduced, and much pain be experienced, it rapidly ceases when they are withdrawn.

Lastly — MM. Haime, Brétonneau, Velpeau, and Meyranx, instituted several experiments on dogs by passing needles into the brain, heart, lungs, stomach, &c., and little or no inconvenience, as remarked above, was experienced, provided the needles were extremely fine. Cloquet passed his needles so deeply into the chest of an animal as to leave no doubt, that they had penetrated the lungs, and he subsequently pierced the liver, stomach, and testicles without the supervision of any unpleasant results.

The pain occasioned by acupuncture is generally easily tolerated; but at times it is so violent, that the patients cry out; the violence however, usually passes away either when the needle is drawn out or forced in deeper. It would seem, that the operation is, as a general rule, most successful when it occasions the least pain. Cloquet asserts, that a kind of electric shock is sometimes experienced in the surrounding parts at the moment of the introduction of the needle; in other cases, a tremulous motion is observable in the fibres of the muscles penetrated. Almost always, some time after the entrance of the needles, a more or less regular aureola or halo of a red colour, and without tumefaction, is perceptible around the needles, which soon disappears after they are withdrawn; but when they are suffered to remain long in the part it may persist for hours.

When the operation is productive of benefit, relief is speedily experienced.

The extraction of the steel needles is ordinarily accompanied by more pain than their insertion, especially if they have penetrated

* Art. Acupunctur. in Encyc. Wörterb. u. s. w. S. 317. Berlin, 1828.

deeply, and been retained in the flesh for a long time. The difficulty is owing to their having become oxidized, and consequently rough on the surface. In withdrawing them, it is advisable to give them a movement of rotation, and at the same time to press upon the skin surrounding them with the thumb and index finger.

In the hospitals of St. Louis, La Pitié, and Hôtel Dieu, of Paris, acupuncture was practised some thousands of times, and in every case, according to Guersent, without the occurrence of any thing unpleasant. Pelletan, however, affirms, that he saw it on four occasions followed by slight faintness at the hospital St. Louis, but none of the cases assumed the characters of full syncope. Gaultier de Claubry has frequently seen faintness, febrile movements, spasm, and insupportable pain produced by it, and Heyfelder saw it followed by convulsions and fainting. Béclard has related a case where the needle penetrated to the bone, and occasioned intense pain. The patient remained a long time faint, and afterwards violent delirium ensued, which gradually ceased in the course of the day, and was followed by great debility. Subsequently, an abscess formed in the part on which the operation was practised.

As to the *modus operandi* of acupuncture, we cannot conceive its effects to be any thing more than a new nervous impression, produced by the needle in the parts which it penetrates. The needles having been found oxidized, especially at the point, it has been supposed by some, that the oxidation is connected with the remedial agency, and it has been even affirmed, that in some diseases they oxidize more readily than in others.* It is a sufficient reply to this view, that beneficial results are obtained from the use of needles made of metals that do not become oxidized, and that the steel needles oxidize in the sound, as well as in the diseased body, and even in parts that have been removed from the body, and placed in warm water; for in the cold dead body, it is affirmed, the phenomenon is not observed. Cloquet and Pelletan think, from their experiments, that the effects of acupuncture are a consequence of the development of the nervous fluid — which they liken to the galvanic — around the needles; a view which is denied by Pouillet and Béclard, but adopted in a modified form by Dr. Bache,† who throws out the conjecture, “that in many cases of local pain this accumulation of the nervous (electrical) fluid depends upon the altered state of the various fasciæ or condensed sheets of tissue, giving them the power, to a certain extent, of insulating the parts which they serve to embrace.” The explanation is ingenious, but we do not think it necessary, if ade-

* Gräfe, loc. cit. S. 319.

† Op. citat. 305.

quate, to explain the phenomena. We have no doubt, that the effects are owing to a concentration of the nervous power towards the part transfixed by the needle, so that a derivation of the nervous influx is induced towards the seat of pain, or towards the nerves particularly concerned in the production of the pain; but farther than this we know not.

There is one phenomenon, by the way, which is dependent on the oxidation of the needle. When the free extremity of an inserted needle is connected with the ground by means of a conducting substance, or is put in connexion with a soft part of the patient's body, it becomes the seat of a galvanic current, which is exhibited by the multiplier of Schweiger. That this phenomenon is dependent upon the oxidation of the metal is proved by the circumstance, that it does not take place when an unoxidizable metal is employed.*

Acupuncturation has been used by Berlioz† in *gouty* and *rheumatic* cases; by Haime in *rheumatic, spasmodic, and convulsive affections*, and by Demours in *amaurosis*, and *ophthalmia*, the needles being inserted in the temples; Finch advised it in *anasarca* practised on the feet; he also discharged, in this way, the fluid of *ascites*.‡ Pipelet§ employed it advantageously in a violent *convulsive affection*. The needles did not remove or markedly diminish the symptoms, but they postponed their recurrence. Michaelis|| cured a case of *rheumatism* by it, but he did not find it so serviceable in *œdema of the feet*, as the fluid would not flow readily through the minute apertures. Friederich proposed, that in cases of *asphyxia*, when every other remedy had been employed unsuccessfully, the cavities of the heart should be penetrated by a needle to excite its contraction, and this plan was subsequently advised by Carraro,¶ who found, from his experiments on cats, that they could in this way be resuscitated after drowning, when every manifestation of vitality had ceased. His experiments, however, when repeated by Dr. E. J. Coxe,** of Philadelphia, were not found to succeed. J. Cloquet obtained the happiest results from acupuncturation in *neuralgia, rheumatism, muscular contractions, spasms, pleurodynia, cephalalgia, ophthalmia, toothach, epilepsy, gout, gastralgia, contusions, lumbago, periodical amaurosis, diplopia, paralysis*, &c. A case of *neuralgia*, after amputation, has been

* Riecke, S. 16.

† Op. citat. Paris, 1816.

‡ Lond. Med. Repos. Mar. 1823.

§ Journal Complém. du Dict. des Sciences Médic. t. xvi. 1823.

|| Gräfe und Walther's Journal, B. v. St. 3.

¶ Annal. univ. di Medicin, 1825. See, also, Provincial Med. and Surg. Journ., May 15, 1841.

** North. Amer. Med. and Surg. Journal, ii. 292.

reported as cured by it.* The patient was attacked by agonizing pains, not only in the stump, but also in the opposite thigh, accompanied by convulsions and fainting. In this state, two needles were planted in the course of the sciatic nerve. These produced no effect, but as soon as the third was introduced, the patient exclaimed, "the doctor has struck the toe of my foot." The needle was then pressed still deeper, so as to pass through the nerve, when the pain immediately ceased. After the needles had remained in half an hour, they were removed, and the patient enjoyed a sound sleep and awoke free from pain. About twenty days afterwards, the pain recurred; the needles were again applied, and relief as instantaneously followed.

Several cases of *neuralgia* removed by it have been published by Prof. Riberi, of Turin.†

It is in *rheumatic affections* that its success has been most marked. Dr. Elliotson‡ cured 30 out of 42 cases by it in St. Thomas's hospital. In *sciatica* its efficacy has been evident.§

By Velpeau it has been proposed to cure *aneurism* by acupuncturation. In performing some experiments on animals he found, that arteries punctured by the needle became the seat of a coagulum, and were ultimately obliterated. In 1830, he read a paper before the *Académie des Sciences*, of Paris, proposing the operation in the cases in question.|| He found in his experiments, that whenever the needle remained three days in the flesh, the transfixed artery was completely obliterated.

M. Bonnet, Chirurgien-en-chef to the Hôtel Dieu at Lyons,¶ has affirmed, that he treated eleven cases of *varicose veins* by introducing pins through their cavities, and allowing them to remain there some time. Nine of these cases were cured. The same treatment was applied to *herniary sacs*. He passed three or four pins through the herniary envelopes close to the inguinal ring, and in order that they might exert a certain degree of compression, as well as of irritation, on the sac, he twisted the points and heads upwards so as to give them a circular direction. The inflammation and pain usually commenced on the third or fourth day after the operation, and the pins were removed a few days afterwards. M. Bonnet had treated four cases of inguinal hernia by acupuncturation. In two, the hernia was small, and three weeks sufficed for the cure : the third was more troublesome.

* *Bulletino delle Scienze Medich.* Ottobre, 1838, and *Brit. and For. Med. Review*, Jan. 1840, p. 252.

† *Medico-Chirurg. Rev.* April, 1841, p. 501.

‡ *Art. Acupuncture*, *Cyclop. Pract. Med.*; Lond. 1832.

§ Renton, in *Edinb. Med. and Surg. Journ.* for 1830, xxxiv. 100; and Dr. Graves, in *Lond. Med. Gaz.* July, 1831, and *Lond. Med. and Surg. Journal*, April, 1833.

|| *Lond. Med. Gaz.*, and *Amer. Journal of Med. Scienc.*, Aug. 1831, p. 510.

¶ *Bulletin Général de Thérapeutique*, and *Dunglison's American Medical Intelligencer*, for Dec. 1, 1837, p. 317.

Caution is of course requisite not to injure the spermatic cord.

In a subsequent communication, M. Bonnet inculcates the necessity of causing the obliteration of the veins in several places separated from each other by short spaces.*

Of late, acupuncture has been revived† in the treatment of *hydrocele* by Mr. Lewis, Mr. King,‡ and others. It consists in carrying a common sewing needle — of the size used for sewing a button to a shirt — through the skin, the dartos and cremaster, into the bag containing the fluid, so that a drop of the fluid follows the instrument as it is withdrawn. It is executed in nearly the same manner as the ordinary method of tapping with a trocar, except that the needle, which should be oiled, cannot be plunged in so easily as that instrument. Mr. King suggests, that the needle should be fixed in a handle, by which means it can be made to enter with comparative facility. After the operation, a compress, moistened with a discutient lotion, may be kept on the scrotum, and the patient may walk about or remain at rest, as may best suit him. The phenomena which present themselves in a few hours are as follows: — the swelling begins to be less circumscribed, and to lose its tenseness, and the cellular tissue of the scrotum becomes gradually more and more infiltrated with the fluid, which before distended the tunica vaginalis, and which, in the space of from twenty-four to forty-eight hours, will, according to Mr. King, have entirely changed place. In five or six days, the infiltration disappears, and the patient is cured.

Mr. Lewis first introduced the method as a palliative cure, but he has seen cases where a radical cure was effected by it.§ He considers the principle of puncturing with a fine pointed needle not only applicable to promote the absorption of the fluid in *hydrocele*, but in every case of *encysted dropsy*.||

Reference has already been made to the use of acupuncture in *anasarca*. The author has used it advantageously to drain off the fluid from the cellular membrane: in such cases larger needles are needed; some prefer them to be of the size of an ordinary glover's needle, and of a triangular shape; a puncture of this kind being less likely to close.¶

* Archives Générales de Médecine, Mai, 1839. See, also, Mr. Dodd, in Medical Gazette, Dec. 20, 1839.

† Mr. Travers, in Lond. Med. Gazette, Feb. 1837, p. 737. Mr. Lewis, Ibid. Feb. 1837, p. 788. Mr. Robert Keate, Ibid. p. 789.

‡ British Annals of Medicine, No. 1, p. 13.

§ Dr. Davidson, in Edinb. Med. and Surg. Journ. for Jan. 1838.

|| Lancet, May 7, 1836, and Jan. 14, 1837. See a case of Ovarian Dropsy, in which it was employed by Dr. Robert D. Thomson, in Lancet, May 25, 1839, p. 344; and one of Ascites by Mr. Campbell, Lond. Med. Gaz., Nov. 1838.

¶ Dr. Graves, Lond. Med. Gazette, Oct. 1838. See, also, Mr. King, Ibid. Oct. 7, 1837, and Nov. 25, 1837.

In the mass of cases, it need scarcely be said, this course can act merely in a palliative manner,—the cause of the dropsical accumulation persisting. Still, as Dr. Graves has remarked, under favourable circumstances, and in a good constitution, the simple operation of evacuating the fluid, by punctures made through the skin, has been, of itself, sufficient to effect a cure.

In a lady, under his care, general anasarca came on after fever, and resisted every form of treatment he could devise. When he had made many fruitless attempts to produce absorption by means of internal remedies, another practitioner was called in, who practised acupuncture of the lower extremities, and succeeded completely.

Lastly, Mr. Vowell* has published a case in which acupuncture was successfully employed for the removal of a *ganglion*. A young lady under his care had been affected with a ganglion of a considerable size on the extensor tendons of the foot, which produced not only disfiguration, but some uneasiness. Mr. Vowell applied blisters, and afterwards iodine ointment and pressure, for above a month, without benefit. He then inserted the tambour *porte-aiguille* of his patient. Pressure was applied, and within a week the tumour had completely disappeared.

When acupuncture is conjoined with electricity or galvanism, it constitutes *electro-puncture*, and *galvano-puncture*. (q.v.)

VII. ÆTHER HYDROCYAN'ICUS.

SYNONYMES. *Æther Prussicus*, Hydrocyanic, or Prussic Ether.
German. Cyanäther.

This preparation was discovered some years ago by Pélouze,† and, according to Magendie,‡ it resembles in its effects hydrocyanic acid, without being so violent a poison, and, consequently, he esteems it worthy of regard as an addition to the *materia medica*.

MODE OF PREPARING.

Equal parts of *sulpho-vinate of baryta* and *cyanuret of potassium* are mixed intimately together, put into a glass retort, to

* *Lancet*, Aug. 25, 1838, p. 770.

† *Journal de Pharmacie*, xx. 399. Paris, 1833.

‡ *Formulaire* — dernière édition.

which a tubulated receiver is adapted, and exposed to a moderate temperature. By distillation, a colourless, or slightly yellowish fluid is obtained, which separates into two distinct strata. The lighter consists chiefly of hydrocyanic ether, which is not pure however, but mixed with water, alcohol, sulphuric ether, and hydrocyanic acid. In order to purify it, it must be strongly shaken, and, with four or five times its bulk of water, must be exposed for some time to a temperature of 60° or 70° centigrade; it must be again agitated with a little water, decanted, suffered to remain in contact with chlorinated lime for twenty-four hours, and then distilled. The ether thus obtained is pure. It is a colourless fluid, of a penetrating, disagreeable garlicky odour. Specific gravity 0.78. It boils at 82° centigrade; is very slightly soluble in water, but soluble in every proportion in alcohol and sulphuric ether. In its pure state, it does not disturb a solution of nitrate of silver. It inflames very readily, and burns with a blue light. Potassa decomposes it with difficulty, and only when highly concentrated.

EFFECTS ON THE ECONOMY.

Six drops of this ether placed in the throat of a dog, occasioned, in a short time, deep respiratory efforts: the dog fell on its side, and convulsions succeeded, with considerable motion of the paws. This condition continued for four minutes, after which the effects gradually disappeared, and in the course of half an hour passed away. Six drops injected into the jugular vein rapidly caused death, with symptoms similar to those induced by hydrocyanic acid. According to Magendie, these experiments were frequently repeated by him with different modifications, after which he ventured upon its administration in disease. He added six drops of the ether to a mucilaginous linctus, and prescribed it to a patient labouring under *hooping-cough*, who, in the course of a few days, derived signal benefit from it, and without complaining of its penetrating, disagreeable odour. The same good effects happened to several patients to whom he gave it in the Hôtel Dieu. But although the results were favourable in cases in which the hydrocyanic acid was indicated, he found it often necessary to discontinue its use, on account of the invincible nausea which its smell induced. Magendie advises it in those diseases in which mixtures of hydrocyanic acid have been found of service.

VIII. ALUMINÆ SALES.

SYNONYME. Salts of Alumina.

In making experiments on the agency of various substances as antiseptics, M. Gannal* found, that the aluminous salts are alone possessed of the property of preserving animal matters,—“their bases combining with geline to form a special compound, the acid being set free.” He found the aluminous deliquescent salts to be, of all saline substances, those that afford the most satisfactory results. The ACETATE of ALUMINA and CHLORIDE of ALUMINUM succeeded perfectly. A mixture of equal parts of chloride of aluminum at 20° Beaumé (s. g. 1.161), and of the acetate of alumina at 10° (s. g. 1.075), proved as good an injection as we possess for the preservation of dead bodies.

The preservation of animal substances appears to depend upon the combination of geline with alumina; but the acid sulphate does not possess enough of the preservative element; and hence M. Gannal was driven to the employment of the salts of alumina, that are richer in alumina, and more soluble in water. Of all these, the SULPHATE of ALUMINA was found to merit the preference, owing to its being of simple preparation and moderate price.† It may be made by the direct combination of *alumina* and *sulphuric acid*; and contains 30 *per cent.* of the former to 70 *per cent.* of the latter. A kilogramme—about two pounds, eight ounces, and a dram and a half troy—dissolved in two quarts of water, and costing twenty cents, M. Gannal found to be sufficient, in winter, to preserve a body fresh by injection for three months. To preserve it for a month or six weeks, it was not even necessary to inject the blood-vessels,—an enema of one quart, and the same quantity injected into the œsophagus being sufficient for the purpose. In hot weather, the solution must be stronger, or in greater quantity, and it should be injected into the carotids.

The acetate of alumina, of which M. Gannal made use, was prepared by the addition of *acetate of lead* to *sulphate of alumina* and *potassa*. The acetate of alumina, thus prepared, at 18° of Beaumé's areometer, and in the quantity of five or six quarts, was sufficient to preserve a body for five or six months. This salt of alumina is, however, too costly; and, therefore, can-

* History of Embalming, &c., by J. N. Gannal, Paris, 1838, translated by R. Harlan, M.D., p. 203. Philad. 1840.

† Ibid. p. 233.

not be employed in amphitheatres, where large quantities are required.

In the report on M. Gannal's memoir presented to the Institute of France, the commission adduce, in favour of his plan, the experience of MM. Serres, Dubreuil, Bourgery, Azous, Velpeau, and Amussat.

"In the month of June, 1836," says M. Serres, "in the amphitheatre of the hospital, the body of a man, 22 years of age, was injected. Left to the open air, in a room exposed to the south, and upon a wooden table, it was preserved until the month of September, and was ultimately mummified. In the month of July, eight bodies were injected for dissection, and kept fifteen days. During the months of August and September, sixty subjects were injected. They were kept for twenty days." From these experiments, M. Serres concludes, that the liquid furnished by M. Gannal, permits the dissection of bodies during summer, which had not been practicable in the anatomical schools of the hospitals of Paris; and that it gave to the instruction in operative medicine a development, which it had not previously enjoyed; for, during the months of August and September, they were enabled to have thirty bodies at a time on the tables, as in the middle of winter, so as to enable them to repeat before the students all the operations required in a regular course of operative surgery.

For his discovery the Institute of France awarded M. Gannal the grand Monthyon prize of 1600 dollars, established for the discovery of any means calculated to remedy the unwholesomeness of any art or profession.

A useful application of M. Gannal's process is said to have been made by the police of Paris, in preserving bodies for many weeks in the Morgue or dead-house, where suspicions of murder required an unusual retention of the body above ground.*

The specimens of pathological anatomy, preserved in the liquid of the injection, were not exempt, according to Dr. Harlan, from the usual inconvenience attached to similar preparations in a solution of chloride of sodium and other salts, being equally liable to incrustations, so as to require a change or renewal of the solution.

The salts of alumina have been used in this city with the view of temporarily preserving the dead; and a case has been published recently, in which the acetate was employed; but the corrosive chloride of mercury was used along with it, which was altogether unnecessary. In the afternoon of the day on which the individual died, the abdominal aorta was injected upwards and downwards with a saturated solution of corrosive chloride

* Harlan, Appendix to Gannal, op. cit., p. 254.

in alcohol; and on the following day, a saturated solution of acetate of alumina was thrown in, "which," says Dr. Sharpless,* "had the immediate effect of giving the whole body a manifest rose colour, making it resemble life in a remarkable degree."

The salts of alumina have been chiefly employed to prevent putrefaction in the dead body; but they might, doubtless, be used with eminent advantage as external applications in cases that require the topical use of antiseptics.

IX. ANTHRAKO'KALI.†

This article was first proposed by Dr. Polya, of Pesth, in the year 1837.

MODE OF PREPARING.

Two forms are employed, the SIMPLE and the SULPHURETTED. The former is prepared by dissolving *carbonate of potassa* in 10 or 12 parts of *boiling water*, and adding as much *slaked lime* as will separate the potassa. The solution thus obtained contains only caustic potassa. The filtered liquor is placed on the fire in an iron vessel, and suffered to evaporate until neither froth nor effervescence occurs, and the liquid presents a smooth surface like oil. To this is added the *levigated coal* in the proportion of 160 parts to 192 parts of potassa. The mixture is stirred and removed from the fire, and the stirring is continued until a black homogeneous powder results. This powder is kept in a dry place.

To obtain the SULPHURETTED ANTHRAKOKALI, 16 parts of *sulphur* must be mixed accurately with the *coal*, and the mixture be dissolved in the *potassa* as directed above.

EFFECTS ON THE ECONOMY IN DISEASE.

M. Polya affirms, that Anthrakokali exerts its influence on the skin generally, and especially on *chronic cutaneous affections*. It has also been given beneficially in *scrofula* and *chronic rheumatism*.

* Medical Examiner, Aug. 13, 1842, p. 513.

† From *ανθραξ*, 'coal,' and *kali*, 'potassa.' See MM. Jacobovics, in *Gazette Médicale de Paris*, Nos. 9 & 12, and Riecke, *Die neuern Arzneimittel*, u. s. w. 2te Auflage, S. 37. Stuttgart, 1840; also, Mr. Duhamel, *American Journal of Pharmacy*, Jan. 1843.

The dose of the simple and sulphuretted preparations is 10 centigrammes (gr. iss.) three times a day.

FULIGOKALI (q. v.) is an analogous substance.

X. AQUA AMYGDALA'RUM CONCENTRA'TA.

SYNONYMES. Water of Bitter Almonds.

French. Eau d'Amandes Amères.

German. Bittermandelwasser.

The water of bitter almonds has been received into many of the modern Pharmacopœias; — into those of Bavaria, Paris, Ferrara, Hanover, Hesse, and Prussia, for example.

METHOD OF PREPARING.

The Pharmacopœia of Prussia directs it to be prepared in the following manner: — Take two pounds of *bitter almonds*, bruise them well, and add — whilst triturating them — ten pounds of *spring water*, and four ounces of highly *rectified spirit of wine*. Let the mixture rest for twenty-four hours in a well closed vessel, and then distil two pounds. The product must be kept in a well stopped bottle.

The inequality in the strength of the *Aqua lauro-cerasi* and of medicinal hydrocyanic acid suggested this preparation, which was extolled by Hufeland for its uniformity. Its effect is entirely like that of the *Aqua lauro-cerasi*, but its greater regularity in strength and action has not been confirmed.

Giese found the quantity of hydrocyanic acid contained in the product of the above formula half less than that in the cherry laurel water; and Jörg, from his experiments upon himself and others, proved it to be much weaker and more uncertain.

Neither this preparation, nor the distilled aqua lauro-cerasi, is much employed in this country, or in Great Britain.

It has been used by Dr. Hodgkin* as a means of allaying distressing itching, as in *prurigo senilis*. In some cases, it produced immediately a beneficial effect; in others, it caused no benefit, but produced smarting and irritation. Mr. May keeps a solution of the *oil of bitter almonds* in the proportion of one part to seven of alcohol. This he uses as a substitute for hydrocyanic acid for internal administration; he gives about half a drop for a dose. Externally, he employs it of the strength of a drop of the solution to an ounce of water.

* Pharmaceutical Transactions, Sept. 1841; and Amer. Journ. of Pharmacy, Jan. 1842, p. 352.

XI. AQUA PICIS LIQUIDÆ.

SYNONYMES. Aqua Picis, Aqua Picea, Infusum Picis Liquidæ seu Picis Empyreumaticæ Liquidæ, Potio Picea, Tar Water.

French. Eau de Goudron.

German. Theerwasser.

This preparation, at one time so much extolled, and recommended on the authority of the celebrated Bishop Berkeley, but which had almost fallen into total disuse, has been recently revived, more especially since it has been found to contain creasote. It was first employed extensively in England about the middle of the last century, and was drunk not simply as a therapeutical but as a prophylactic agent, so that, Riecke facetiously remarks, almost as much tar-water was consumed by the inhabitants of London, as beer and other drinks !*

As commonly happens in such cases, practitioners passed from one extreme to the other, and as they gradually found that tar water was not capable of accomplishing *all* that had been ascribed to it, they ultimately neglected it altogether. Still, formulæ for its preparation exist in many Pharmacopœias — in those of Dublin, Bavaria, Brunswick, Paris, Russia, Saxony, Sweden, and Wirtemberg, for example.

Water takes up from tar a small portion of acetic acid, creasote, and resinous matter ; and tar-water was formerly much praised as a remedy in *pulmonary consumption*, and as a diuretic ; its virtues, however, appear to rest almost wholly on the contained creasote.

Some years ago, Arnheimer, of Duisburg, recalled the attention of practitioners to it as a remedy in many *chronic cutaneous affections*, especially of the herpetic kind ; and he asserted, that he found no remedial agent more valuable when its use was persevered in for one or two months to the extent of a pint or two daily. Arnheimer directed patients to prepare it for themselves in the following manner. A pound of *tar* was put into a deep porcelain dish, and a quart of *water* was poured upon it ; for half an hour it was stirred with a spoon ; the mixture was then allowed to stand for twenty-four hours ; the tar remaining on the surface of the water was skimmed off, and the clear fluid put into well stopped bottles.

He advises, that a large quantity should not be prepared at once, as the water in time becomes ropy and its golden yellow colour is changed to a darker hue. It is generally taken without any repugnance.

* Die neuern Arzneimittel, S. 38. Stuttgart, 1837.

The process in the Dublin Pharmacopœia is the following : — Take of *Tar*, two pints ; *Water*, a gallon : mix, and stir with a wooden rod for fifteen minutes ; then, when the tar has subsided, filter the liquid, and keep it in well closed jars.

Since the discovery of creasote, tar-water has received fresh consideration, and it is not improbable, that it may come again into more general use, as it appears, from recent experiments, that there are cases where it would seem to merit a preference over creasote. M. Pétrequin has lately made some trials with both, in *chronic catarrh*, and in different stages of *phthisis*.*

The number of cases reported by him is twenty-three ; of these seven were of *chronic catarrh*, in which creasote was given ; generally the cough was mitigated by it, but in two no effect was produced on that symptom. The expectoration was usually diminished or facilitated ; in two cases, however, no advantage was derived from it, and in one case the sputa were bloody. In the majority, the dyspnœa ceased ; in others, it continued ; and in the same number of cases the pain in the breast was relieved by its use.

As to its effects on the digestive organs, it several times excited thirst ; but the most marked result was the sensation of burning, which it caused in the majority of cases, in the digestive tube, or in the breast. In two cases, it exhibited no influence on an existing diarrhœa, whilst in two others, it appeared to diminish the number of the evacuations. In two it excited vomiting, and commonly produced nausea. On the whole, in the greater number, it appeared to render good service, but in one it was of no avail, and in another it seemed to aggravate the affection.

In four cases of *incipient phthisis*, treated with creasote, M. Pétrequin obtained the following results. Although in one instance, the cough was aggravated ; in the majority, the opposite was the fact. The expectoration was facilitated but diminished in quantity ; the dyspnœa was more or less improved, and in two cases the pain in the chest was relieved. In this disease, also, creasote excited burning in the epigastrium or chest, and in one instance fugitive sensations of heat and creeping in the limbs. In one case, the benefit was striking ; in two, the improvement was to a less extent, and in one the disease was augmented.

Four other cases were of *advanced phthisis*. In most, the cough was more or less improved, — never increased ; the oppression remained much the same, but in one case it became more severe. As regards the effects upon the digestive organs, they were much the same as in the first class of cases. The improvement in one case was insignificant ; in two others but slight, and in the fourth the affection was aggravated.

* Gazette Médicale de Paris, No. 45, Nov. 5, 1836.

M. Pétrequin directs tar water to be prepared by digesting an ounce of *tar* in a quart (*pinte*) of *water* for eight days, and then filtering. It is taken mixed with milk, and to the extent of from eight to twelve ounces in the day. With this preparation, he treated three cases of *chronic catarrh*. The cough was always improved by it; the expectoration diminished or facilitated; the dyspnœa alleviated or removed, and the pains in the chest were improved or dissipated.

In two cases, it appeared to act beneficially on *vomiting* which accompanied the cough. The appetite was improved, and in one case, *diarrhœa* seemed to be diminished, whilst in two others, existing *constipation* yielded during its use. In all the cases, sleep was restored. On the urinary secretion it exerted no influence, and it neither excited thirst nor nausea like creasote.

In three cases of *incipient phthisis*, its action was more beneficial than that of creasote. The cough was always ameliorated, the expectoration facilitated or diminished, and the dyspnœa and thoracic pain relieved. In one case, it seemed to act favourably on accompanying emesis, and in another to quench thirst. It excited or improved the appetite, and aided digestion.

In one case of *advanced phthisis*, the alleviation produced by the tar water was beyond all expectation, but in another the disease had proceeded so far that it was wholly unsuccessful.

So far, then, as M. Pétrequin's experiments go, they would seem to show that advantage may be derived, in the cases in question, from the administration of creasote and tar water; and that the latter is perhaps possessed of properties which the other has not — to the same degree at least. The cases are, however, too few to enable us to deduce any thing entirely satisfactory.

Fresh experiments will doubtless be instituted, which may enable us to infer positively on matters that must as yet be considered involved in doubt.*

The author has administered it freely in *phthisis*, as well as in *chronic bronchitis*. In the latter affection, it has relieved cases, in which the accustomed excitant expectorants are found to be serviceable. The same has been the fact in the former disease; but farther than this no advantage has accrued from its administration.

In a late French periodical,† some cases are published from the records of the hospitals for 1829 and 1830, during the attendance of the late Professor Dupuytren, in which injections of tar water were successfully administered in *catarrhus vesicæ*, along with the use of pills of turpentine. The tar water was made by in-

* Deslandes, Dict. de Médec. et de Chirurgie prat. xi. 233.

† La Lancette Française, Avril 8, 1837.

fusing in the cold, for a night, a pound of *tar* in ten pounds of *spring water*, filtering and warming the solution before using it. Large quantities of this were injected through an elastic gum catheter, which was forthwith withdrawn and the patient directed to retain the injection as long as possible. The injection was repeated daily, and Venice turpentine was administered internally in the form of pills.

A SYRUP OF TAR may be made by dissolving sugar in tar water.*

ARGENTI PRÆPARATA.

SYNONYMES. Preparations of silver.

German. Silberpräparate.

Of the preparations of silver, the nitrate is the only one that has been much used, and this chiefly as an external application. Recently, however, the attention of physicians has been directed to the internal use of many of those preparations, and especially by M. Serre,† professor of surgical clinics at Montpellier. This gentleman commenced his first trials in May, 1835, in the civil and military hospital of St. Eloi. At this time, there was an unusual number of *syphilitic* patients in the wards, of which the most severe and appropriate were selected for treatment by the preparations of silver—the chloride, cyanuret, and iodide. Trials were also made with divided metallic silver, oxide of silver, and chloride of ammonia and silver. At first, these preparations were administered iatroleptically; the chloride, the cyanuret, and the iodide in the quantity of one-twelfth of a grain; the chloride of silver and ammonia in the quantity of one-fourteenth of a grain; and the oxide of silver, and the divided silver, in the dose of one-eighth, and one-quarter of a grain, respectively. M. Serre soon found, that these doses were generally too small: he, therefore, raised that of the chloride and the iodide to one-tenth and one-eighth of a grain, without the slightest inconvenience resulting. The other preparations were also increased in the same proportion, with the exception of the chloride of silver and ammonia, which requires more precaution than any of the other preparations.

M. Serre did not restrict himself to the iatroleptic administra-

* Soubeiran, *Journal de Pharmacie*, Janvier, 1842, p. 70.

† *Bulletin Général de Thérapeutique*, 1836.

tion of these substances, but employed them internally in the form of pill, and externally as local applications. The formulæ preferred by him were the following:—

Pulvis argenti chloridi.

Powder of chloride of silver.

R. Argent. chlorid. gr. j.
Pulv. irid. florent. gr. ij.

Reduce to a fine powder, and divide into eight or ten portions; to be rubbed on the tongue.

Pilulæ argenti et ammoniæ chloridi.

Pills of chloride of silver and ammonia.

R. Argent. et ammon. chlorid. gr. j.
Pulv. irid. florent. gr. ij.
Conservæ flor. tilix q. s. ut fiat massa in pilulas xiv. dividenda.

For external use,

Unguentum oxidi argenti.

Ointment of oxide of silver.

R. Argent. oxid. gr. xx.
Adipis. ʒj. Misce, ut fiat unguentum.

When the iodide or cyanuret is substituted for the oxide of silver, ten or twelve grains of one of these may be added to the ounce of lard.

M. Serre describes several cases of *syphilis* in which the preparations of silver were administered according to the above forms. The first patient was a soldier, 26 years old, of athletic constitution, who, at the time of his admission into the hospital, had several large *chancres* on the prepuce, so close to each other as to seem to form one large circular ulceration, five or six lines in diameter. After a few days' rest, and the use of baths, M. Serre ordered the chloride of silver in friction on the tongue in the quantity of one-twelfth of a grain. The ulcers were treated

with simple cerate (*ceratum Galeni*) spread on lint. After the second rubbing, the patient experienced violent colicky pains, which were not severe enough, however, to induce a discontinuance of the remedy. Scarcely had a grain of the chloride been employed, when the secretion from the ulcerated parts became less; the surface of the chancres lost the kind of grayish border which they possessed, and cicatrisation proceeded rapidly. The frictions were continued, and the condition of the patient went on improving. At the end of two months, he left the hospital.

In the five subsequent cases, the same plan of treatment was pursued. The chloride was used exclusively according to the iatroleptic method. The symptoms were various; in addition to chancres, there was in one case a suppurating bubo; in another, syphilitic vegetations at the margin of the anus; and in a third, fissures in the same part. In the seventh case, in which there were *chancres*, *gonorrhœa*, and extensive rugous *blotches* on the nates, the chloride of silver was rubbed on the tongue, and applied topically in the form of ointment. The eighth patient, who suffered with large *condylomata*, as well as with *ulcers* in the neck, took the chloride in pills to the extent of nine grains in the course of the treatment; frictions with the ointment of silver were also applied to the affected parts.

M. Serre deduces from all his experiments the following amongst other conclusions. *First.* The preparations of silver have this great advantage over those of mercury, that they never occasion salivation, nor do they induce in the intestinal canal or in the respiratory organs, the disagreeable effects that are too often caused by mercury. *Secondly.* That should their therapeutical agency be confirmed by experience, and they be introduced into hospital practice, great advantage will be derived as respects the purity of the wards, and the cleanness of the bedclothes, &c. *Thirdly.* That patients can be treated by them in secret as well as when travelling, without fear of detection. *Fourthly.* That the preparations of gold are to be preferred in these respects; but that gold has the disadvantage of exciting too much, and cannot, therefore, be exhibited to those of a nervous and excitable temperament, or who have weak and delicate chests. In such cases the preparations of silver merit the preference. *Fifthly.* The preparations of silver are much cheaper than those of gold, and are, therefore, more available in practice amongst the poor, and in large hospitals; and, moreover, they are more easily prepared, which is a consideration of some moment, as regards the *pharmaciens* of small towns. *Sixthly*, and *lastly*. There are cases in which mercurial and gold preparations fail, and where the preparations of silver might be of advantage.

The observation of others has not confirmed the assertions of

M. Serre. M. Ricord* employed the various preparations, made after the formulæ given by M. Serre, in the same doses ; but not being able to observe any effect that could be fairly ascribed to the agents, he ventured upon considerably larger doses, as much, for example, as twelve grains a day of the iodide and cyanuret, but without any marked results.

In this country, the preparations of silver have been but little, if at all, used in *syphilis*, nor do they appear to merit special favour.†

XII. ARGEN'TI CHLO'RIDUM.

SYNONYMES. Argentum Muriaticum, A. Salitum, Chloruretum Argenti, Argentum Chloratum, Chloride, Chloruret or Muriate of Silver.

French. Chlorure d'Argent.

German. Salzsauers Silber, Chlorsilber.

Chloride of silver is prepared by the decomposition of a solution of *nitrate of silver*, by an excess of a solution of *chloride of sodium*. The resulting product, or chloride of silver, appears under the form of a flaky, clotted, very *thick* precipitate ; it must now be washed repeatedly with *boiling water*, and be exposed to the heat of a sand-bath, so that it may dry as speedily as possible.

Chloride of silver, prepared in this way, is of a white colour, devoid of taste, and not soluble in water, but soluble in ammonia. In the light it speedily changes, especially when much divided, or when moist ; and assumes a somewhat dark violet hue, as the chlorine is given off.

Chloride of silver suffers no decomposition when united with vegetable matters. It must be dried and kept protected from the light.‡

Its uses have been referred to under the head of the preparations of silver. (p. 62.)

As the nitrate of silver must be converted into chloride of silver by meeting with the chlorohydric acid in the stomach, Dr. Perry,§ at the time, resident physician of the Philadelphia Hospital, administered the chloride with advantage in epilepsy, chronic dysentery, chronic diarrhœa, and other affections in which nitrate of silver is given internally. Twelve grains given daily for three months produced no unpleasant symptoms ; and

* J. J. L. Rattier, La Lancette Française, No. 122, Oct. 13, 1836.

† Dr. W. P. Johnson, Medical Examiner, Nov. 23, 1839, p. 743.

‡ On the mode of forming the various preparations of silver, see Chamou, in Bulletin Général de Thérapeutique, No. xvi. Aug. 30, 1836.

§ Duglison's American Medical Library and Intelligencer, Feb. 1841.

in no case did discoloration of the skin succeed. In epilepsy, three grains, given four or five times a day, produced effects similar to those of nitrate of silver, but more marked. In chronic dysentery, half a grain to three grains, given three times a day, produced immediate diminution in the number of the evacuations, and relieved the tormina; inducing, at the same time, an improvement in the character of the stools and other symptoms.

The author has very frequently prescribed the chloride; and on the whole it has appeared to him to be equal to the nitrate of silver in the cases mentioned by Dr. Perry.

It has been affirmed recently, that a combination with iodine will prevent the discoloration of the skin; and that the use of iodine will remove it where it has already occurred; but farther experience is necessary to establish this. See ARGENTI IODIDUM (p. 68).

XIII. ARGENTI ET AMMONIÆ CHLORIDUM.

SYNONYMES. Argentum Muriaticum Ammoniatum, Chloruretum Argenti et Ammonia, Chloride or Chloruret of Silver and Ammonia.
French. Chlorure d'Argent et d'Ammoniaque.
German. Silbersalmiak, Salzsaures Silberammonium.

This preparation is obtained, when we saturate, by the aid of heat, *liquid ammonia* with freshly precipitated and carefully washed *chloride of silver*. The operation must be accomplished at such a degree of heat, that the fluid shall boil once; for if the boiling be continued a few moments and in the open air, no crystals will be deposited on cooling. If the fluid, whilst in full ebullition and preserved from the light, be filtered, very regular crystals will be deposited on cooling, which may be dried between blotting paper, and should be kept in a well stopped bottle.

Chloride of silver and ammonia has a bluish-white colour, the peculiar smell of ammonia, and a burning, almost caustic, taste. In the air, it gradually exhales ammonia, and acquires all the properties of simple chloride of silver, without, however, losing the form of the original composition.

If the crystals be kept in the ammonia in which they were formed, they do not experience the slightest change in their colour from the influence of light. When treated with distilled water, the chloride is decomposed. A portion saturated with ammonia is again dissolved; yet a much greater portion remains undissolved; this contains only a small quantity of ammonia. It experiences the same decomposition through the influence of heat, as when it is exposed to the open air, except that the decomposition takes place more rapidly. It displays nothing extraordinary, when rubbed with organic matters.

This remedy, as before remarked, has also been used with advantage by Serre in cases of *syphilis*.

Another preparation, the *Liquor argenti muriatico-ammoniati*, has been long recommended by Kopp, in cases of *chronic nervous affections*. It is prepared according to the following formula : —

R. Argent. nitrat. fus. gr. x.
Aquæ destillat. f.℥ij.

Soluto filtrato instilla liquoris natri muriatici, (Sodæ Muriatis,) q. s. ad præcipitandum. Præcipitatum sedulo ablutum solve in liquoris ammon. caust. ℥iss: adde acidi muriatici ℥iij. vel q. s. ut præcipitatio evitetur et argentum muriaticum in statu solutionis permaneat. Pondus fluidi filtrati æquale sit unciiis duabus cum dimidiâ.*

This preparation is transparent ; but, under the effect of light, it suffers black flakes to be deposited. It is therefore necessary to preserve it in small bottles, painted black, in a dark place. In using it, acid substances should be avoided.

Kopp found this *liquor argenti muriatico-ammoniati* of great efficacy in *St. Vitus's dance*. It may be given to children of about ten years of age, morning, noon, and night, in doses of three drops, gradually raised to six, in a spoonful of distilled water. (See page 63.)

XIV. ARGENTI CYANURETUM.

SYNONYMES. Argenti Cyanidum, Argentum Cyanogenatum, Cyanuretum Argenti, Cyanide or Cyanuret of Silver.

French. Cyanure d'Argent.

German. Blausstoffsilber, Cyansilber.

Cyanuret of silver is obtained by permitting a weak solution of *hydrocyanic acid* to act on a solution of *nitrate of silver*.† The very light white precipitate, formed thereby, must be repeatedly washed with *distilled water*, and be reduced to dryness in a moderately heated oven. In the preparation of the cyan-

* "Take of fused nitrate of silver, ten grains ; distilled water, two ounces : Into the filtered solution drop enough of a solution of chloride of sodium to precipitate. Dissolve the carefully washed precipitate in an ounce and a half of caustic liquid ammonia ; add three drams of muriatic acid, or enough to avoid precipitation, and the muriate of silver may remain in a state of solution. The weight of the filtered fluid should be equal to two ounces and a half."

† Pharm. of the United States, p. 77, Philad. 1842.

nuret of silver, as of the iodide, it is essential to pour on only so much of the fluid in the formation of the precipitate as may be required for the complete decomposition of the nitrate of silver. If too much hydrocyanic acid be used, a part of the precipitate will be separated in the form of hydrocyanate of silver. If, instead of hydrocyanic acid, hydrocyanate of potassa be used, the latter, if added in too great proportion, will unite with the cyanuret of silver, and form a soluble double salt.

Cyanuret of silver is of a white colour, devoid of taste, not soluble in water, but soluble in ammonia. In the air, the surface very soon becomes of a dark violet hue, similar to that of the chloride of silver under like circumstances. It is dry, and should be kept preserved from the light. It experiences no decomposition when mixed with neutral vegetable matters.

Its use in disease has been referred to under the preparations of silver.

XV. ARGENTI IODIDUM.

SYNONYMES. *Argentum Iodatun, Ioduretum Argenti; Iodide or Ioduret of Silver.*

French. Iodure d'Argent.

German. Iodsilber.

Iodide of silver is obtained by mixing a solution of *nitrate of silver* with one of *iodide of potassium*. The yellowish flakes, produced by the admixture of the two fluids, are then washed several times with distilled water, and dried in an oven.

In this preparation, also, it is important, that only so much of the reagent should be added as is necessary for the complete decomposition of the salt of silver. A surplus of the iodide of potassium would form with the already precipitated iodide of silver a soluble and crystallisable double salt of iodine, whereby the quantity of the product, which it might be desirable to obtain, would be diminished.

Iodide of silver is of a very pale yellow colour; but becomes, under the action of light and air, of a deeper yellow. It has no taste, and is neither soluble in water nor in ammonia. The latter property serves to distinguish it from the chloride and the cyanuret of the same metal. Like the chloride, the iodide must be kept in a dry dark place. Neutral vegetable substances appear to exert no action upon it.

Its properties have been enumerated under the head of the preparations of silver. It has been already remarked (p. 65) that a combination with iodine is said to prevent the discoloration apt to be induced by nitrate of silver.

The following form for this purpose is given by Dr. Patterson :*—

Pilulæ argenti iodidi compositæ.

Compound pills of iodide of silver.

R. Argenti iodid.
Potassæ nitrat. āā gr. x.
Tere simul ut fiat pulvis subtil. dein adde
Glycyrrhiz. pulv. ℥ss.
Sacchar. ʒj.
Mucilag. acaciæ q. s. ut fiant pil. xl.

Dose. — One, three times a day.

XVI. ARGEN'TI OX'IDUM.

SYNONYMES. Argentum Oxydatum, Oxydum Argenti.

French. Oxide d'Argent.

German. Silberoxyd, Oxydirtes Silber.

Oxide of silver is obtained by the reaction of *potassa* on a solution of *nitrate of silver*. The alkaline fluid must be added in excess, and the oxide, which is the product of the decomposition, must be washed several times in a considerable quantity of water, and be dried by moderate heat, and preserved from the light.

The following form has been given recently :†—

R. Argent. nitrat. crystallizat. ℥i.
Potassæ, ℥vij.
Aquæ puræ, ℥xviij.

Dissolve the nitrate of silver in two or three ounces of the water, and the potassa in the remainder : mix the two solutions ; stir with a glass rod, and throw the whole upon a filter. Lastly, wash the precipitate from adhering alkali, and dry it carefully.

In the state of hydrate, the oxide is black ; when anhydrous, it appears as an olive greenish brown powder ; it is tasteless, and capable of absorbing carbonic acid from the air. Under the long continued influence of light, it is blackened ; and at a heat below

* Med. Chir. Rev., Oct. 1842.

† A. Duhamel, Amer. Jour. of Pharmacy, July, 1842, p. 100.

obscure red, it is reduced to the metallic condition. To be kept for a long time in the pure state, it must be protected from the light, in a well stopped bottle.

This preparation, which was also recommended by M. Serre, has been used by Van Mons in *syphilis*.* (See p. 62.)

Mr. Lane†—under the idea, that nitrate of silver is always decomposed in the stomach by chlorohydric acid, whence results chloride of silver, which enters into the circulation, is conveyed to the cutaneous surface, and is converted into an oxide by the action of light, and by its strong affinity for albumen—has administered the oxide of silver with advantage in *diseases of the uterine system*, in which there is undue secretion and great irritation. He gave the oxide for two months, at intervals, without the slightest tendency to discoloration; and Dr. Golding Bird had prescribed it for four months without any bad effects. Mr. Lane found it very beneficial in half-grain doses, twice a day, in *cardialgia* and *pyrosis*; *gastrodynia*; *irritability of the stomach*, accompanied by gnawing and constant pain, and nausea, &c. It seemed, likewise, to be beneficial in *uterine hemorrhage*, both in the impregnated and unimpregnated state.

XVII. ARGENTUM DIVISUM.

SYNONYMES. Metallic Silver, in a state of division.
German. Zertheiltes Silber.

Pure *oxide of silver* is placed in a porcelain crucible, and the fire is increased to dull redness. The product is then allowed to cool, rubbed in an agate mortar, and sifted through a close sieve or bolting cloth.

In this condition, divided silver forms a very fine powder, of a dullish white colour: the air has no influence upon it, unless when impregnated with sulphureous vapours.

Besides the use of this preparation in syphilis, already referred to, it may be remarked, that the filings of silver, *Argentum limatum*, which agree with it in chemical relations, had been administered ten years before in cases of intermittent fever, by Dr. Meyer, of Bückeburg.‡

Notwithstanding the testimony adduced in its favour, it is probably wholly inert, or exerts but a mechanical agency.

* Riecke, Op. cit. S. 440.

† London Lancet, July 10, 1841.

‡ Riecke, Op. cit. S. 436.

XVIII. ARGILLA PURA.

SYNONYMES. Alumina pura, Terra aluminosa pura, Terra aluminis, Terra bolaris seu argillacea pura; pure Argil or Alumina.

French. Alumine factice.

German. Reine Thonerde; reine Alaunerde.

This substance was known in olden times by the names *Armenian Bole*, *Terra sigillata*, &c., in which forms it was always, however, mixed with lime and iron. It was highly extolled as an absorbent, demulcent, diaphoretic and astringent; was employed in *hemorrhage*, *diarrhæa* and *dysentery*, *phthisis*, *poisoned wounds*, &c., and was also applied externally in cases of *erysipelas*. It had almost fallen into complete oblivion, when its use was resumed by some of the German practitioners. With us, it is scarcely ever, if ever, prescribed.

METHOD OF PREPARING.

The purest argil is prepared by drying *sulphate of alumina and ammonia*, and exposing it for 20 or 25 minutes to a red heat, in a crucible: the sulphuric acid and ammonia are driven off, and the argil remains behind in the form of a white powder. Formerly, it was prepared by dissolving *alum* in water, and precipitating the argil from the solution by means of *carbonate of potassa* or of *soda*, or by *potassa*. It is affirmed, however, that, generally, more or less sulphuric acid remained with the earth, so that it required to be purified by repeated washing, until there was no longer any acid reaction. If a still higher degree of purity be needed, the precipitate is dissolved in muriatic acid, and the argil precipitated by ammonia.

The powder, prepared by these methods, is of a white colour and devoid of smell or taste; but it communicates to the tongue a feeling of astringency. When breathed upon, it yields a peculiar earthy smell. It is insoluble in water, but attracts moisture greedily from the air, and forms with it a gelatiniform mass.

EFFECTS ON THE ECONOMY IN DISEASE.

Pure argil was highly recommended by Percival in *indigestion attended with predominance of acidity*; and it was in such cases extolled by the Dresden physicians, Ficinus and Seiler.*

* Zeitschrift für Natur. und Heilkunde der Dresdner Professoren, B. 1. H. 1, S. 82.

According to the former, it merits a preference over all other absorbents, inasmuch as it forms astringent salts with acids. He found it especially useful in *diarrhœa* and *dysentery*, particularly in children. Seiler recommended it in the *vomiting of infants*, which is usually accompanied by acidity, and in the *diarrhœa* of older children.

Neumann* found it successful in checking *diarrhœa*, which neither starch glyster, nor opium, nor any other therapeutical agent had succeeded in diminishing. He made a mixture of two drams of *argil*, and four ounces of a *decoction of logwood*, and administered it to children by the teaspoonful. Weese,† also employed it successfully in several cases of *infantile diarrhœa* where there was evidently a predominance of acid. The latest encomiast of the *argilla depurata* is Dürr, who, for several years, has administered it in the *diarrhœa* and *cholera of infants*, and has found it highly efficacious.

The chemical reasons, urged by Ficinus and others, merit attention. The article is worthy of employment in *affections of the intestinal tube*, in which astringents are indicated. The muriatic, and the acetic or lactic acid are always in the stomach when any alimentary or other matter is present there; these acids cannot fail, consequently, to unite with the argil, and the resulting compound must possess astringent properties.

MODE OF ADMINISTERING.

The dose, in the 24 hours, for a very young child, is from ʒss. to ʒj.; for older children, from ʒj. to ʒij. Smaller doses are of little or no avail. The vehicle is commonly an emulsion.

The following forms are given by Riecke:‡ —

Mistura argillæ.

Mixture of argil.

R. Emuls. sem. papav. (ex ʒss. parat.) ʒiiiss.
 Argillæ puræ, ʒij.
 Syrup. althææ, f. ʒss. M.

Dose. — A teaspoonful to a child two years old affected with *diarrhœa*.

* Bemerkungen über die gebräuchlichsten Arzneimittel, von Dr. Karl Georg Neumann, S. 55, Berlin, 1840.

† Rust's Magazin, B. xii. H. 2, S. 247.

‡ Die neuern Arzneimittel. S. 41. Stuttgart, 1837.

R. Argill. pur. ℥ss.
 Acac. ℥j.
 Sacch. ℥ij.
 Aq. fœnicul. f.℥iij. M.

Dose. — The same as the last to a child one year old.

R. Emuls. oleos. cum vitell. ovar. parat. ℥j.
 Syrup. alth. f.℥j.
 Argill. depurat. ℥ss.
 Aq. cinnam. simpl. f.℥j.
 Extract. conii, gr. ij. M.

Dose. — The same as the two last to a child three months old, affected with *cholera infantum*.

Dürr.

XIX. AR'NICA.

SYNONYMES. Arnica Montana, A. Plauensis, Doronicum Germanicum, Panacea Lapsorum, Ptarmica Montana, Caltha Alpina, Calendula Alpina, Narda Celtica altera, Doronicum plantaginis folio, Leopard's Bane.
French. Arnique, Tabac ou Bétoine des Savoyards, Tabac de Montagne, Doronic d'Allemagne, Tabac des Vosges.
German. Wohlverlei, Falkkraut.

This plant, which belongs, in the *sexual system*, to Syngenesia polygamia superflua, and to the *natural order* Compositæ Synanthereæ, is in the secondary list of the Pharmacopœia of the United States, but it is not much used in this country; nor does there appear to be any clear appreciation of the cases for which it is adapted.* Such, too, appears to be the sentiment of the French practitioners. "It may be concluded," says MM. Mérat and De Lens,† "that we have as yet insufficient data to pronounce positively on the affections in which arnica can be unequivocally efficacious; we must, consequently, always bear in mind its heating and active qualities when we prescribe it."

In Germany, the flowers and root are much employed in *paralysis*, as an excitant to the nervous system; and it is chiefly to introduce the volatile oil — the *oleum æthereum florum arnicæ*,

* Dr. Wood, in Dispensatory of the United States, by Drs. Wood and Bache, Art. *Arnica*.

† Dictionnaire Universel de Matière Médicale, &c. i. 423. Paris, 1829.

(Germ. *Wohlverleilöl*) — to the attention of the profession, that we refer to the *arnica* at all. This oil is obtained from the flowers, and has been much recommended by Schneider in old cases of *paralysis*, which are the result of the apoplectic condition. He himself often administered it with evident success; the paralytic limbs becoming warmer, more active, and more serviceable under its use.

Schneider mixes four drops of *arnica oil* with half an ounce of *spiritus ætheris sulphurici compositus* or *spiritus ætheris nitrici*, and of this he gives, for a dose, from four to twelve drops several times a day. The mixture has an agreeable smell and taste. Four drops of the oil to four ounces of sugar form a good *elæosaccharum*.*

XX. ARSEN'IAS AMMO'NIÆ.

SYNONYMES. Ammonium Arsenicum, Arseniate of Ammonia.

French. Arséniate d'Ammoniaque.

German. Arseniksaures Ammonium.

This preparation of arsenic has been highly recommended, since the year 1818, by Biett, in several *cutaneous diseases*, and especially in *psoriasis inveterata*.†

METHOD OF PREPARING.

It may be prepared by taking *arsenic acid* one part,* dissolving it in water, and adding *pure ammonia* or *carbonate of ammonia* sufficient to saturate the acid; — or, as follows: — Take of *arsenious acid*, one part; *nitric acid*, four parts, *muriatic acid*, half a part; saturate the solution with *carbonate of ammonia*, and let the arsenical salt crystallise.

EFFECTS ON THE ECONOMY IN DISEASE.

A grain of this salt may be dissolved in an ounce of distilled water; and of the solution from twenty to twenty-five drops be

* Riecke, Die neuern Arzneimittel, u. s. w. S. 337. Stuttgart, 1837.

† Cazenave, in Dict. de Médec. 2d edit. iv. 30; and Cazenave's and Schadel's Practical Synopsis of Cutaneous Diseases, translated by R. E. Griffith, M.D. Philadelphia, 1829.

given daily, gradually increasing the dose until it reaches a dram or more in the twenty-four hours.

There does not seem to be much difference between the effects of this preparation and those of other forms of arsenic, that have been received into the Pharmacopœias. Arsenious acid itself, as well as *Arsenite of potassa* and *Arsenate of soda* — the officinal solution of the former well known everywhere under the name of "*Fowler's Solution*;" that of the latter known, in continental Europe especially, under the name "*Aqua Arsenicalis Pearsonii*" or *Solution de Pearson*, are possessed of precisely the same properties as arseniate of ammonia, and, like it, have been found equally efficacious in obstinate diseases of the skin. Nor is the knowledge of the agency of arsenical preparations in *cutaneous affections* new. In India, the efficacy of arsenic in those diseases has been long known: and, in Europe, attention was attracted to it by Fowler,* and Girdlestone,† and subsequently by Willan,‡ Pearson,§ and others; but no one administered the arsenical preparations more extensively in these diseases than M. Biett, of Paris, whose situation afforded him ample opportunities for testing the virtues of the different articles of the *Materia Medica* in skin complaints. He has succeeded by means of the arsenical preparations, and especially of the one now under consideration, in removing several *inveterate affections of the skin*, that had resisted every other remedy. The author has found equally beneficial results from this practice in his own experience. All chronic cutaneous diseases are dependent upon an alteration in the functions of the capillary vessels or vessels of nutrition of the part affected; and there appear to be but two ways in which those vessels can be reached, so that a new action may be impressed upon them; — in the one case, through the medium of the general circulation; and, in the other, through the agency of topical applications, made to come in contact with the diseased surface. Arsenic, — like iodine, mercury in small doses, and certain other alteratives, — acts in the former way, modifying, after a protracted exhibition, the fluid of the circulation in such manner, that it makes an altered impression on the morbid capillaries, and breaks in upon the diseased catenation. In no case, however, have we observed these salutary effects, until the use of the arsenical preparation had been persevered in for several weeks. These diseases are chronic in their nature, and they require a chronic medication. Time is, indeed, in every case, an element in the cure.

* Medical Reports. London, 1786.

† Essays on the Hepatitis, &c. of India. London, 1787.

‡ Description and Treatment of Cutaneous Diseases. London, 1798.

§ Observations on the effects of various articles of the *Materia Medica* in the Venereal Disease, 2d edit. London, 1807.

XXI. ARSEN'ICI IODI'DUM.

SYNONYMES. Ioduretum Arsenici, Arsenicum Iodatum, Iodide of Arsenic.
German. Iodarsenik, Arsenikiödüre, Iodarsen.

Of late years, this preparation has been highly extolled by Biett, in the same class of affections as the last ; — applied externally.

METHOD OF PREPARING.

The iodide is prepared, according to Magendie,* in two ways :
 1. By heating in a glass alembic, a mixture of sixteen parts of *arsenious acid* and one hundred parts of *iodine*. The combination sublimes in the form of orange coloured needles. 2. Thirty parts of pulverised *arsenious acid*, and one hundred parts of *iodine* are boiled in one thousand parts of water. As soon as the liquid becomes colourless, it is filtered, and the filtered solution is evaporated to dryness. If it be thought advisable, this can be sublimed.

A formula, employed by Plisson, is to digest three parts of *arsenious acid*, in fine powder, with ten parts of *iodine*, and one hundred and nine parts of *water*, until the odour of iodine is no longer manifested. The clear liquid is then decanted, and subjected to evaporation. At a certain degree of concentration, the iodide forms in red crystals ; or the solution may be evaporated to dryness, and then sublimed in close vessels without decomposition.

Water, in large quantity, dissolves it wholly ; but if it be digested with a small quantity, it is decomposed, hydriodic acid being formed in solution, and white crystalline scales, composed of water, acid, and iodide in variable proportions.†

EFFECTS ON THE ECONOMY.

When iodide of arsenic is injected into the veins, it does not exert so strong an action on the heart as might be expected from so poisonous a substance. Mr. Blake‡ twice injected solutions, containing each six grains of this substance, into the jugular vein of a dog, without producing the slightest appreciable effect on the heart. On injecting a solution, containing fifteen grains, the action of the heart was immediately arrested.

* Formulaire, edit. cit.

† A. Duhamel, American Journal of Pharmacy, Oct. 1840, p. 187.

‡ Edinburgh Medical and Surgical Journal, April, 1839, p. 336.

MODE OF ADMINISTERING.

Biett has frequently applied the following ointment in cases of *phagedenic tuberculous herpes*.

R. Arsenic. iodid. gr. iij.
 Adipis. ℥j.
 M. exactè ut fiat unguentum.

Cazenave gives, as the usual proportion for an OINTMENT, one part of the *iodide* to eighteen of *lard*.

Professor A. T. Thomson has employed the iodide in several cases of *lepra* and *impetigo*, with very great success.* He begins with tenth of a grain doses three times a day, and increases them to a quarter of a grain. In some cases, he had not been able to exceed two-thirds of a grain, as symptoms of poisoning came on, and the medicine had to be given in diminished doses.

More recently, the iodide has been given with success in a case of *cancerous disease of the breast*, by Dr. F. C. Crane.† The dose was an eighth of a grain, which was reduced to one-twelfth, and gradually increased to a third of a grain, beyond which it could not be borne. In a case of inveterate *lepra vulgaris*, it was carried to the extent of one grain the dose, with the most decided curative effects.

An extemporaneous preparation, which is considered to combine the virtues of both arsenic and iodine, is said to have been employed successfully in Philadelphia. It is formed as follows:

R. Liquor iodin. compos. ℥i.
 ——— potassæ arsenit. ℥iv. M.

When mixed together in these proportions, a change is observed in the appearance of the mixture, which is instantaneously rendered almost colourless. The dose is five drops.‡

* Lancet. Jan. 19, 1839, p. 621.

† Lancet, Aug. 31, 1839.

‡ A. Duhamel, Amer. Journ. of Pharmacy, Oct. 1840, p. 187.

XXII. ARTEMISIA VULGARIS (RADIX).

SYNONYMES. Mugwort.

French. Armoise commune.

German. Beifusswurzel, Gemeiner Beifusswurzel.

Almost all the species belonging to the genus *artemisia* are possessed of bitter and aromatic properties, and several afford "*wormseed*." *Artemisia vulgaris* was employed by many of the older physicians, but it had fallen into oblivion, when its use was revived in Germany, by Burdach, a physician at Triebel, near Sorace,* who recommended it strongly as a preventive of epilepsy. Since that time, it has been much prescribed in that country, but its employment has not extended much to other countries of Europe, or to this side of the Atlantic. The root is the part preferred:—formerly the herb and the tops were solely used.

The root was employed in epilepsy, centuries ago, but it had been neglected, or was only exhibited as a nostrum, when Burdach entered upon his investigations, of which the following is a summary.

The root of the *artemisia* should be dug up in autumn, after the stalk has become dry, or in the spring before the stalk has shot up; but perhaps the latter half of November is as good a period as any. It must be freed from the adherent earth by shaking. Burdach regards washing to be objectionable, as the root may lose some portion of its efficacy thereby. The old, ligneous, mouldy, and damaged parts of each root must be carefully removed, and the fresh young side roots (*fibrillæ*), which are distinguished by their smell, clear colour, and greater juiciness, must be spread on paper, and dried in the shade, and as soon as they become brittle they must be carefully preserved. Besides the *fibrillæ*, the soft, sound, and juicy parts of the root, especially the fleshy rind of the thicker roots, must be used.

The period, required for drying them, varies; in moist weather, it may require two months; but late in the year the desiccation may be aided by the gentle warmth of the sun, or of a stove; the latter must never, however, rise higher than from sixty-four to sixty-eight degrees of Fahrenheit. If put away too early, the root becomes spoiled; if, too late, it loses many of its volatile parts. When powdered, it ought not to be kept too long, as the volatile portions escape and it soon becomes devoid of smell. Even during the process of pulverising, loss is sustained,

* Hufeland's Journal, B. lviii. St. 4 und 5.

and the fresh powder has a much feebler odour than the entire root, so that Burdach advises for distant patients, that the root in substance should be sent to them, and that they should be recommended to pound it for use in a well covered mortar. By pulverising, the inner, hard, woody parts are separated from the smaller roots; they must be removed and thrown away, as the powder of the cortical substance of the small radicles has alone been found efficacious. The smell of the well dried root is very strong, pungent and peculiar, especially when we open a vessel in which it has been stored away in quantity. The taste is sweetish, sharp and nauseous.

EFFECTS ON THE ECONOMY IN DISEASE.

It has been already remarked, that Burdach* recommends the artemisia especially in *epilepsy*; and he affirms that it requires no preparation or special attention.

It is most efficacious when given about half an hour before the attack, which it usually prevents; but if this be impracticable, it may be given as soon as the patient comes to. The dose is a heaped up tea-spoonful, (from fifty to seventy grains,) which may be administered in warm beer; the patient should be put to bed immediately, be covered up warm, and allowed warm small beer to drink, so as to occasion diaphoresis — care being taken that he does not expose himself to cold. This course is to be repeated so long as there are any traces of mischief. When the remedy, however, acts favourably, Burdach asserts, that frequent repetition is not often necessary. At times, it happens, that when the dose has been raised to a dram and a half, and thrice repeated, no critical sweat follows; Burdach then aids the operation by giving the *liquor cornu cervi succinatus*, (*spiritus ammoniæ succinatus*), in an infusion of serpentaria, valerian root and arnica flowers; but the effect, he says, was always better when the diaphoresis was produced by artemisia alone. One important advantage in the use of this agent is, that a judgment can be speedily formed of its utility: when much may be expected from it, a marked improvement usually occurs after the first doses. In those cases of epilepsy which recur every day, and sometimes even from three to fifteen times a day, and especially where the paroxysms are so violent and frequent, as to leave little interval for the patient to be restored to consciousness, the artemisia has proved more certain in its operation, either by removing or mitigating the disease. In such cases, two doses were given on the first day, and afterwards one tolerably strong dose daily till the

* Casper's Wochenschrift, Oct. 22, 1836, S. 675.

third day. In those forms of epilepsy, whose attacks recurred twice daily, morning and evening, the artemisia acted very beneficially; the paroxysms soon became somewhat weaker, and shorter, and were postponed a day or two. In such cases it is advisable to continue the remedy for some weeks. Infants at the breast bear the artemisia especially well. It is equally efficacious in the epileptic attacks of young females from twelve to fifteen years of age, and prior to the establishment of menstruation. Under its use, the catamenia have generally taken place, and the epilepsy has disappeared. On the other hand, it was found to aggravate cases of epilepsy occurring as a disease of growth, (*Entwickelungskrankheit*,) in young persons from seventeen to twenty-two years old, and as a consequence of great corporeal development. It was equally unfortunate in cases of *epilepsia nocturna*, where the paroxysms came on irregularly at an interval of about five, ten, or fifteen days, and generally about midnight; as well as in that form in which, — after the patient had suffered for six, seven, or eight weeks, under violent symptomatic sweats, — a morbid condition ensued from two to three times every twenty-four hours, consisting of repeated epileptic attacks, with great prostration in the intervals.

These are the main results of the communications of Burdach on this subject.* The number of his experiments and observations was considerable, and the results appear to have been frequently most happy, especially in the case of females, who seem to have exhibited themselves more beneficially impressed by the remedy than males; the proportion of cures being as three to two. Tosetti† gives the proportion of cases in women and children to that of men, as eight to six.

In the Berlin Charité, artemisia is said to have been used with equal success. The German journals contain numerous cases, on the authority of E. Gräfe,‡ Wagner,§ Van Maanen,|| Wolf,¶ Osann, Bonorden,** Schlüter, Bird,†† Löwenhard,‡‡ Geis,§§ and others.|||| But few physicians, according to Riecke, have been disappointed in it, and, where they have been, he ascribes the failure to its having been given in cases for which it was inappro-

* Riecke, Die neuern Arzneimittel, u. s. w. S. 49. Stuttgart, 1837.

† Diss. inaug. de Radice Artemis. vulg. remedi. antiepilept. Berolin, 1827 : and Osann in Art. Artemisia, Encyc. Wörterb. iii. 313. Berlin, 1829.

‡ Gräfe und Walther's Journal, B. vi. H. 2.

§ Hufeland's Journal, lix. S. 6.

|| Ibid. lxi. 5.

¶ Ibid. lxii. 3.

** Ibid. lx. 1.

†† Ibid. lxv. 3.

‡‡ Ibid. lxv. 3.

§§ Ibid. lxv. 3.

|||| Richter's Specielle Therapie. B. x. S. 377. Berlin, 1828.

priate, or to the preparation of the artemisia not having been properly attended to.*

In consequence of a German physician having recommended *Artemisia absinthium* to Professor A. T. Thomson, Professor Elliotson† was induced to try it in epilepsy. The patient to whom he gave it was a girl, seventeen years of age, who had been affected with epileptic fits for four months — three or four occurring daily. A dram of the powder was given three times a day. This was on the 30th of March. On the 9th of April, the dose was increased to two drams, when the fits became less frequent, but not less severe. On the 16th, the dose was repeated every four hours. She had only one slight fit in the course of twelve days; and on her dismissal, on the 24th of May, she had had no fit for twenty-six days. Dr. Elliotson was of opinion, that the strong infusion would be less offensive to the patient, and quite as effective as the powder.

Besides epilepsy, artemisia has been used with advantage in other diseases, as in *St. Vitus's dance*.‡ Wutzer employed it successfully in the *convulsive diseases of childhood*, and it was recommended by Biermann§ in *eclampsia infantum*, occurring during the period of dentition. He recommended it to be given to children in gradually increasing doses, commencing with half a grain; and giving, an hour afterwards, a grain, and in two hours, two grains, which is usually the last dose required. The gradual augmentation of the dose he considers advisable, "to prevent the crisis which the artemisia induces from being too turbulent." Kölreuter, of Carlsruhe, administered the artemisia in different diseases with great success. He prefers the *extractum resinosum radicis artemisiæ vulgaris* to the root in substance. This is prepared in the following manner. A quantity of the dried and powdered root is covered with alcohol, and permitted to digest for some time: the filtered liquor is then evaporated in an earthenware vessel, until it has attained the consistence of an extract. Kölreuter employed this advantageously in the *eclampsia of children* (in certain cases after the application of leeches); in *tormina* unaccompanied by inflammation; in the *diarrhæa of children and adults*; in sporadic cases of *cholera morbus*, and in *dysentery*, after the bloody evacuations had ceased in *gastric fevers*, on their assuming a nervous character; and in *dysphagia*, *cardialgia*, *chronic vomiting*, *scirrhus of the stomach*, *chronic cephalalgia* and *neuralgia of the face*; in *chlorosis*, and in *obstruction of the catamenia*, as well as in *epilepsy*. The dose in the

* Op. cit. S. 49.

† Lancet, July 9, 1836.

‡ Gittermann, in Hufeland's Journal, lxii. 1. Bonorden, Op. cit.

§ Riecke, Op. cit. S. 50.

twenty-four hours, is from ʒss. to ʒj. ; to small children, a few grains.

Such is the chief testimony adduced in favour of the artemisia by the German writers mainly. It is to be feared, that the advantages to be derived from it in epilepsy have been exaggerated. Where there is no organic disease of the encephalon, substances, which, like it, are nauseous, bitter and aromatic, may be productive of advantage in the way of tonics and revellents. In one case of this nature it was employed by the author, but the results were not striking. When aided by other means and appliances, it appears to be powerfully diaphoretic ; and doubtless, therefore, in appropriate cases — especially where there is much nervous impressibility — it may be productive of the good effects ascribed to it by Burdach, Kölreuter, and others. Yet — as Osann has remarked* — it must be improper where polyæmia, or a tendency to active hyperæmia, is present. The analysis of Hergt, Hummel, and Jänike afforded, along with traces of volatile oil, some balsamic resin, both of which are excitants to the living economy.

MODE OF ADMINISTERING.

The following forms for its administration have been adopted by some of the German authorities :—

Decoctum artemisiæ.

Decoction of mugwort.

R. Rad. artemis. vulg. concis. ʒj.
Coque cum aquæ fontanæ q. s. per semihoram.
ad. colat. Oj.

Half a tea-cupful of this may be taken every two hours in cases of *epilepsy*.

Hildenbrand.

Pulvis artemisiæ.

Powder of mugwort.

R. Rad. artemis. vulg. in pulvere, ʒj.
Sacch. alb. ʒj. M. et fiat pulvis.

The powder to be administered daily in the evening, in warm beer, in cases of *epilepsy*.

Löwenstein.

* Art. Artemisia in Encyc. Wörterb. iii. 313. Berlin, 1829.

Mistura artemisiæ.

Mixture of mugwort.

R. Ext. resin. artemis. vulg. gr. iv.
 Acaciæ, ʒj.
 Sacch. ʒiij.
 Mist. amygd. f. ʒiij.

A coffee-spoonful* to be given every half hour in *eclampsia infantum*. The dose may be gradually raised to two coffee-spoonfuls.
Kölreuter.

AURI PRÆPARATA.

SYNONYMES. Preparations of Gold.

French. Les préparations d'Or.

German. Goldpräparate.

The administration of gold in medicine is not modern. In the times of alchemy, it was frequently used in *nervous diseases, convulsions, hypochondriasis, mental affections, profuse salivation, &c.* Paracelsus, Horst, and Poterius recommended it, united with corrosive sublimate, in *syphilis*. Its violent effects, however, brought it into discredit, and during the decadency of alchemy it fell into entire disuse.† It is probable, too, that many preparations were brought forward as containing gold, which had none of it, and this may partly account for the discredit into which it lapsed.‡ M. J. A. Chrestien§ was the first who — in more modern periods — (about the year 1810) recalled the attention of practitioners to the use of the preparations of gold, and after him many physicians employed them, so that the published results of their observations have furnished us with a considerable amount of evidence in relation to the therapeutical properties of those preparations, and they have, in consequence, been received into many of the modern pharmacopœias.||

* About two ordinary tea-spoonfuls.

† Richter's *Specielle Therapie*, x. 504, Berlin, 1828; and Nachet, *Art. Or*, in *Dict. des Sciences Médicales*, tom. xxxvii.

‡ Riecke, *Die neuern Arzneimittel*, S. 53. Stuttgart, 1837.

§ *Recherches et observations sur les effets des préparations d'Or du Dr. Chrestien, &c.* Paris, 1821.

|| See *Art. Gold*, in *Encycl. Wörterb. der medicinisch. Wissenschaft*. B. xv. S. 77. Berlin, 1837.

As the different preparations agree in their effects on the economy, it may be well to make a few observations which apply to all.

EFFECTS ON THE ECONOMY IN HEALTH.

Orfila made many experiments to discover the action of the preparations of gold on animals. Three dogs, into whose jugular veins he injected a small quantity of the chloride of gold dissolved in water, died speedily — death being preceded by difficulty and rattling in breathing, cough, symptoms of suffocation and slight vomiting; these results supervening immediately after the injection had entered the bloodvessels.

On dissection, the lungs were found livid, engorged with blood, and without any crepitating noise when cut into; wrinkled, discoloured, and scarcely lighter than water; the heart was of a violet colour; the left auricle and ventricle full of black blood, and the right cavities empty and contracted. The effect of the salt supervened with such rapidity, that the blood of the crural artery — which was opened a few minutes after death — was of a brownish-red, almost black, colour. In two dogs, to which he gave the chloride of gold, a torpid condition was induced, which terminated fatally in a couple of days. The mucous membrane of the stomach was found inflamed and ulcerated.

The effects on man of agents so potent in appropriate doses, have been investigated by many observers. Experiments on animals had already exhibited the powerful influence, which they are capable of exerting on the organs and functions of organic life. One of the most prominent effects appears to be, an increase of the various secretions; commonly, the urinary secretion is largely augmented, as well as the transpiration, and the intestinal and salivary secretions. Not unfrequently, under the continued administration of the gold, actual salivation ensues, which differs, however, from that induced by mercury. It is always slow in appearing, is by no means so exhausting as that caused by mercury; nor do troublesome ulcers occur; and the saliva is thinner, and not so tenacious. Like mercury, the preparations of gold occasion excitement in the organism, which often ends in a true febrile condition: after they have been taken for some time in moderate doses, there is generally a feeling of increased warmth in the stomach, and an augmentation of the appetite. The pulse is rendered fuller and more active, and the animal heat and vital activity are augmented, so that in such as are predisposed to the affection, hemorrhage is apt to take place. The catamenia recur sooner than usual under their influence,

and the quantity lost may be greater.* Sooner or later, a regular attack of fever not unfrequently supervenes, — as indicated by shivering, and pains in the limbs, back, and stomach, which may continue for a few hours, but sometimes lasts for days, and at length ends by sweating, depositions in the urine, and occasionally by salivation.

In very large doses, certain of the preparations of gold are corrosive poisons. The symptoms, caused by their use, when they act as such, are — oppression in the region of the stomach; nausea, vomiting, pains in the abdomen and diaphragm, a metallic taste in the mouth, augmented secretion of saliva, without the teeth or gums being affected, pulse excited, and breathing oppressed.† As a general rule, they are not esteemed proper for impressible individuals; on the other hand, in persons of torpid constitutions, they would appear to have exerted an excitant influence even on the generative system. Certain persons, according to Chrestien and Niel, are not susceptible of this action; and, again, there are some, according to Cullerier, junr., who cannot tolerate them in any form.

When too large a dose has been given, the remedy should be entirely discontinued for some time, or the dose be diminished; the effects will soon disappear. One of the greatest recommendations of gold over mercury, in the eyes of many, is, that it does not act so destructively on the organism, and never induces such a cachectic condition as the latter occasionally does.‡

EFFECTS ON THE ECONOMY IN DISEASE.

The diseases, in which the preparations of gold have been administered, in modern times, are chiefly the following.

1. *Syphilis*. — They have been occasionally used in primary sores, but have been mainly employed in secondary syphilis, especially in old cases, where a doubt often exists, whether more of mercurial cachexia or of syphilis be present. They are given, also, where there is a scrofulous complication, and where it is desirable to exhibit some other remedy than mercury; and lastly, their use is indicated where mercury has failed in removing syphilis.§ Many practitioners doubt, whether the preparations of gold should be esteemed much inferior to those of mercury. Numerous experiments, instituted, amongst others, by Chrestien,||

* Riecke, *Op. cit.* S. 55.

† Grötzner, in *Rust's Magazin*, xxi. 3.

‡ Riecke, *Op. cit.* S. 56.

§ Eberle, *Treatise on the Mat. Medica*, 2d edit. i. 247.

|| *Op. Citat.* p. 6; see, also, *Lettre à M. Magendie sur les préparations d'Or*, &c. Paris, 1828.

Cullerier, junr.,* S. L. Mitchill,† Niel, Biett, Lallemand,‡ Wendt,§ and Legrand,|| have shown, that their employment has been most advantageous in the different forms of syphilis, and that they have rarely disappointed expectation. Alibert found them especially useful in syphilitic eruptions. It must be borne in mind, however, that when they are given in syphilis, their operation is slow, and that, in the first instance, the symptoms may appear aggravated: they are not, therefore, adapted for cases in which it is important to act speedily, so as to arrest the disease at once, and prevent its farther development.

2. *Gonorrhœa*. — In protracted cases of gonorrhœa, several physicians¶ have extolled the preparations of gold; others, as Wendt and Ritter, have advised them for the sequelæ of gonorrhœa (*Trippernachkrankheiten*): it is not probable, however, that they could be of much use in gonorrheal affections, which, as is well known, are curable without any mercurial preparations.

3. *Scrophula*. — The efficacy of the preparations of gold in scrophula, was deposed to by Chrestien, Eberle, Niel, Legrand,** Herrmann, and Kopp.†† According to observation, it would appear, that they effect improvement in the mildest cases, and are beneficial where there is much torpor, but that they ought to be avoided in irritable subjects. In scrophulous ophthalmia, and in scrophulous porrigo, they would seem to have been most efficacious.

Recently, the preparations of gold have been employed by M. Baudelocque, at the *Hôpital des Enfants Malades*, and by M. Velpeau at La Charité.‡‡ At the former institution, they were given in enormous doses. M. Baudelocque gave the chloride and the stannate in doses of from ten to twelve grains, without producing any effect on the disease, and without any apparent injury to the constitution of the children subjected to the experiment. The oxide of gold prepared by potassa was carried as high as twenty grains during the day. At La Charité, Velpeau gave fifteen, eighteen, and twenty grains of the chloride and oxide of gold during the day, — and higher doses were not tried, solely on account of the expense of the medicine. These results are strongly discordant from those of Orfila and Devergie, the former of whom affirms, that the chloride of gold is more active than the corrosive chloride of mercury; and the latter states, that

* Dict. des Sciences Médicales, Art. Or., tom. xxxvii.

† Dyckman's Dispensatory, p. 201, and Eberle, Op. cit.

‡ Journal Universel des Sciences Médicales, t. xxvii.

§ Rust's Magazin, Bd. xvi. St. 1.

|| Gazette Médicale de Paris, Oct. 30, 1837.

¶ Grötzner, Op. cit.

** Bulletin Général de Thérapentique, No. xv. Août. 15, 1837.

†† Denkwürdigk. in der ärztl. Praxis, iii. 351.

‡‡ L'Experience, No. lxxxvii.; and Lancet, March 23, 1839, p. 31.

in the dose of one-tenth to one-twentieth of a grain, it produces more or less inflammation of the lining membrane of the stomach and intestines.

4. *Scirrhus and cancer*. — The utility of the preparations of gold appears to have been most decided in scirrhus induration of the tongue, according to the observation of Wendt, Helm, and others; in such case, they are rubbed on the tongue; this, indeed, is the most common form of administration. H. Hoffmann relates a case of scirrhus of the pylorus, in which the chloride of gold was entirely successful; and frictions with the chloride, or the oxide of gold on the labia pudendi have been recommended by Hufeland, Herrmann, Meissner, Grötzner, Gozzi,* and others, in cases of scirrhus and cancer of the uterus. In the same affections, Krimer has advised them to be applied to the os uteri. Scirrhusities, it is affirmed, have been dispersed through their agency; and even in open cancer marked improvement has been perceptible.

5. In *tumours of the bones*, and in like affections, the preparations of gold have been employed successfully by some practitioners, and especially when the cases originated in syphilis.

6. Several forms of *lepra* have been treated with them by Alibert, and A. T. Chrestien, and with the best effects.

8. In *amenorrhæa*, Carron du Villards employed the cyanuret successfully, beginning before the expected menstrual period.

Lastly. — Wendt, Delafield, and Grötzner have administered them with benefit as diuretics in *dropsy*. With others, however, they have failed. According to Riecke,† the results of experience would seem to show, that they are especially adapted for dropsy dependent upon organic disease of some viscus.

None of the preparations of gold are much employed at the present day. Their expense is, indeed, a weighty objection — unless there were striking advantages in adopting them in special cases of disease in preference to other articles of the *Materia Medica*.

XXIII. AURI CHLO'RIDUM.

SYNONYMES. Aurum Chloratum, A. muriaticum, Chloretum Auri, Murias Auri, Aurum Oxydulatum Muriaticum, Aurum Salitum, Chloruretum Auri, Auri Terchloridum, Muriate of Gold, Chloride of Gold, Terchloride of Gold.
French. Chlorure d'Or, Muriate d'Or.
German. Salzsaueres Gold, Chlorgold, Goldchlorid, Salzsauere Goldoxydül.

This preparation is received into several of the European Pharmacopœias, and is usually formed by digesting one part of *gold leaf* in three parts of the *nitro-muriatic acid*, in a sand bath, and

* Sopra l'uso di alcuni remedi aurifici nelle malattie venere. Bologn. 1817; and Omodei, Annal. Univers. di Medicin., vol v.

† Op. cit. S. 58.

evaporating gently to dryness. Magendie,* however, recommends the following method, which has been adopted in the French "*Codex*."

Take one part of fine *leaf gold*, divide it into small portions, and put it into a vial of white glass; pour upon it three parts of *nitro-muriatic acid* — formed of one part of *nitric acid*, and two parts of *muriatic acid* — and heat the whole in a small sand bath, so arranged, that in case the retort breaks, the fluid may be recovered without loss. The solution of the gold will soon take place. The fluid must then be evaporated until the smell of chlorine is perceptible. This point can be readily determined, as after the decomposition of the nitro-muriatic acid there is a period during which the nitrous acid is alone given off. The disengagement of chlorine indicates the commencement of the decomposition of the chloride formed. The vessel must now be removed from the fire and suffered to cool. The chloride appears immediately as a crystalline mass, in the form of a multitude of beautiful yellow needles. In this condition, chloride of gold is as pure as it need be: it contains no excess of muriatic acid, and is not deliquescent.

It can be preserved in the same vessel in which it has been prepared — by merely stopping it with paper — without any danger of its undergoing decomposition.

Chloride of gold, prepared according to Magendie's formula, is very acid, but this property is not owing to its containing any free acid. The taste is also styptic and disagreeable. It only attracts moisture from the air when it contains an excess of muriatic acid, as is the case in Wendt's preparation. It is readily soluble in water, with which it forms a solution of a beautiful yellow colour.

Many animal and vegetable substances, — and especially the epidermis, — are coloured by it of a purple violet when it is placed in contact with them. Exposed to a moderate heat, it passes to the state of protochloride. When heated to a greater degree in close vessels, chlorine is disengaged and metallic gold left behind.

The chloride is one of the most active of the preparations of gold. It belongs to the class of corrosive poisons,† and greatly resembles the corrosive chloride of mercury in its operation on the economy. It must consequently be administered with caution: — even a tenth of a grain has been known to induce unpleasant irritation of the stomach.‡ It has been given both internally and externally in *syphilis*, *dropsy*,§ and *glandular affections*.

* Formulaire.

† Orfila, Toxicolog. i. 593.

‡ Magendie, Formulaire.

§ Wendt, in Rust's Magazin, B. xxv.

The dose is from one-sixteenth to one-twelfth of a grain once or twice a day, gradually but slowly increased. In the like quantity it has been rubbed upon the tongue and gums. Externally, it has been applied in the form of ointment or watery solution — the last more particularly in *ophthalmia*, especially of the scrophulous kind, in which Jahn found it very efficacious.

The following are some of the forms in which it has been prescribed : —

Boli auri chloridi.

Boluses of chloride of gold.

(*Boli antisyphilitici*, Pharmacopœia Batava.)

Antisyphilitic Boluses.

R. Auri chlorid. gr. ss. ad gr. ij.
Extract. aconit. gr. vj. ad gr. xij. Fiant boli sex.

Two of these to be taken for a dose, and repeated three times a day.

Pilulæ auri chloridi.

Pills of chloride of gold.

(*Pilulæ chlorureti auri*, Ph. Amstelodamensis nova.)

R. Auri chlorid. gr. x.
Glycyrrhiz. rad. pulv. ℥iij.
Syrup. q. s. ut fiant pilulæ cl.

Dose. — One daily, gradually augmenting the quantity.

R. Auri chlorid. gr. i.
Pulv. lycopod. gr. xv. M. fiat pulv. in part. xvi. dividend.

One of the powders to be rubbed upon the tongue and gums daily.

Chrestien.

Gradually, the same quantity of the chloride may be divided into twelve, and afterwards into ten parts, and be used in the same way.

Unguentum auri chloridi.

Ointment of chloride of gold.

R. Auri chlorid. gr. iv.
 Misce intimè cum
 Ung. rosæ. ʒj.

Wendt.

Collyrium auri chloridi.

Collyrium of chloride of gold.

R. Auri chlorid. gr. ij.
 Solve in
 Aquæ destill. ʒvj.
 F. collyrium.

To be applied by means of linen compresses, or dropped into
 the eye. *Jahn.*

XXIV. AURI ET SO'DII CHLO'RIDUM.

SYNONYMES. Aurum Muriaticum (*Pharmac. Borussic.*), Aurum Muriaticum Natronatum, Aurum Chloratum Natronatum, Sodii Auro-Terchloridum, Perchloruretum Auri et Sodii, Chloretum Auri cum Chloreto Natrii, Murias Aurico-natricum, Chloruretum Auri et Sodii, Chloride of Gold and Sodium, Hydrochlorate or Muriate of Gold and Sodium, Auro-terchloride of Sodium.
French. Hydrochlorate, ou Muriate d'Or et de Soude.
German. Salzsaueres Goldnatrum, Chlorgoldnatronium, Goldnatriumchlorid.

This preparation is in the Pharmacopœias of Prussia, Ferrara, Sweden, &c.

Figuier directs it to be prepared in the following manner.* Dissolve four parts of *gold* in nitro-muriatic acid, and evaporate the solution to dryness; add thirty-two parts of *water*, and one part of *chloride of sodium*, and evaporate to one half. On cooling, crystals will form, which consist of 69.3 parts of chloride of gold; 14.1 parts of chloride of sodium, and 16.6 of water.

In the French "*Codex*," it is directed to be made by dissolving 85 parts by weight of *chloride of gold*, and 16 parts of *chloride of sodium*, in a small quantity of *distilled water*. The

* Annales de Chimie, Février, 1822, and Riecke, Die neuern Arzneimittel, S. 63, Stuttgart, 1837.

solution is evaporated by a gentle heat until a pellicle forms, and is then put aside to crystallize.

The formula of the Prussian Pharmacopœia is as follows : —

R. Auri, partes vj.

Solve in

Acidi muriatici, q. s.

Acidi nitrici quantum ad auri solutionem requiritur, guttatim addendo.
Tunc admisc.

Natri muriatici sicc. part. x.

Et post solutionem leni igne evaporando in pulverem flavum redige.*

This preparation has a beautiful yellow colour, and appears under the form of four-sided prisms. It attracts moisture from the air, but to a less degree than the chloride of gold with excess of sulphuric acid.

The *Aurum Muriaticum Natronatum* of the Germans is milder than the preceding preparations, and is more frequently administered, especially in Germany, than any of the preparations of gold. It is used both internally and externally.

The dose is about the same as that of the last preparation, but it may be carried higher.

Kopp affirms,† that he has frequently employed this preparation with advantage, in small doses, in *scrophulous tumefaction of the upper lip*. He prescribed daily, and once or twice a day, from one twenty-fourth to one-thirteenth of a grain of it, reduced to powder, with two grains of sugar, and, by means of the finger, rubbed on the inner side of the affected lip. In cases of *scrophulous, thick, sensible, and slightly inflamed nose*, in the adult, Riecke‡ recommends the ointment, given below, to be applied to the nasal fossæ; and three times a day a powder composed of from one-sixteenth to one-twelfth of a grain of the salt of gold to two grains of sugar of milk, to be rubbed on the gums with the moistened finger. The salts of gold, according to Riecke, appear to have a specific action on the organs in the mouth, on the gums and the nose !

* Take of gold, six parts :

Dissolve in a sufficient quantity of

Muriatic acid, adding as much nitric acid as is required to dissolve the gold. Then mix ten parts of dry muriate of soda; and after evaporating the solution over a slow fire reduce it to a yellow powder.

† Op. cit. B. iii. S. 351.

‡ Die neuern Arzneimittel, u s. w. S. 442.

Pulvis auri et sodii chloridi.

Powder of chloride of gold and sodium.

R. Auri et sodii chlorid. part. iij.
 Irid. florent. in pulv. subtil. part. ix.

Three grains of this represent three-quarters of a grain of the salt of gold. These three grains are divided into thirty frictions for the weakest doses, and into three for the strongest. Starch may be substituted for the powdered orris root.

Legrand.

Liquor auri et sodii chloridi.

Solution of chloride of gold and sodium.

R. Auri et sodii chlorid. gr. ij.
 Aquæ destillat. f. ʒj. M.

Ten drops to be given every two or three hours, in cases of
dropsy. *Grötzner.*

Pilulæ auri et sodii chloridi.

Pills of chloride of gold and sodium.

R. Auri et sodii chlorid. in aquæ destillat. q. s. solut. gr. iv.
 Extract. aconiti, ʒss.
 ——— dulcam. ʒj.
 Althææ rad. pulv. q. s. ut fiant pilulæ lxxx.

Three pills to be taken three times a day. *Grötzner.*

Pastilli auri et sodii chloridi.

Lozenges of chloride of gold and sodium.

R. Auri et sodii chlorid. gr. v.
 Sacchar. pulv. ʒj.
 Misce exactè in mortar. vitreo.
 Mucilag. acaciæ q. s. ut fiant pastilli lx.

Each of these will contain about one-twelfth of a grain of the salt. *A. T. Chrestien.*

Pilulæ auri et sodii chloridi.

Pills of chloride of gold and sodium.

R. Amyli. solan. tuberos. gr. iv.

Acaciæ, ℥j.

In mort. vitr. exactè mistis adde terendo

Aur. et sod. chlorid. — in ℥j. aq. destillat. solut. — gr. x.

Fiant pilulæ cxx.

Each of these contains about one-twelfth of a grain.

A. T. Chrestien.

Unguentum auri et sodii chloridi.

Ointment of chloride of gold and sodium.

R. Aur. et sod. chlorid. gr. iij. — iv.

Adipis. ℥ss.

Misce exactè. Fiat unguentum.

Used in friction.

Grötzner.

R. Aur. et sod. chlorid. gr. iiss.

Adipis, ℥iss. M.

The size of a bean to be placed in the nasal fossæ in *scrophulous cases** along with the iatroleptic use of the powder before described.

Riecke.

XXV. AURI CYANURETUM.

SYNONYMES. A. Cyanidum, A. Tercyanidum, Cyanuret, Cyanide or Tercyanide of gold.

French. Cyanure d'Or.

The mode of preparing this combination, recommended by M. O. Figuier,† of Montpellier, is as follows. He decomposes *chloride of gold* by cyanuret of potassium, but states, that many precautions are necessary to procure it in a pure state. The chloride must be as neutral as possible, which can only be effected by recrystallising the salt several times. The cyanuret must not

* See page 91.

† Journal de Pharmacie, xx. S. 99. and Amer. Journ. of Pharm. vi. 82. Philad. 1833-4. See, for another mode of preparing it, Deferre, in Bulletin Général de Thérapeutique, Février, 1838.

be alkaline, or contain any formiate or carbonate of potassa. This salt is to be added to the solution of the chloride of gold very cautiously as long as there is any precipitate, taking care that there is not the slightest excess of the cyanuret, as this would cause a solution of part of the product, and the formation of soluble double cyanurets. The cyanuret, thus made, is to be well washed with pure water, and dried in a dark place.

The process in the French "*Codex*" consists essentially in adding very carefully a solution of pure *cyanuret of potassium* to a solution of *chloride of gold*, until a precipitate — which is cyanuret of gold — ceases to be formed. The chloride of gold, prior to solution, should be deprived of all excess of acid by heating it in a salt water bath.

It is a yellow powder, which is insoluble in water.*

In some experiments, Magendiet found, that cyanuret of gold is one of the substances that promote the coagulation of the blood. Where, consequently, it is desirable to impress a modification on that fluid in chronic cutaneous, and other, affections, its administration might perhaps be found useful.

M. Pourché,† who has used it successfully in *syphilis* and *scrophula*, recommends its administration — in the form of frictions on the tongue — mixed with powdered orris root, well washed in alcohol, and dried.

Pulvis auri cyanureti.

Powder of cyanuret of gold.

R. Auri cyanur. gr. j.
Pulv. irid. florent. gr. iij. M.

In pills he prescribes it as follows : —

Pilulæ auri cyanureti.

Pills of cyanuret of gold.

R. Auri cyanur. gr. j.
Ext. mezereon. gr. iij.
Althææ pulv. q. s. ut fiat massa.

Each pill to weigh five grains.

To children, the dose at first should never exceed one-fifteenth of a grain.

* Pereira, Elements of Mat. Med. &c. 2d edit. i. 686. Lond. 1842; or Amer. edit. by Dr. Carson, Philad. 1843.

† Leçons sur le Sang, &c.; and Translation, in Lancet, January 20, 1839, p. 636.

‡ Journal de Pharmacie, xx. 599 and 649.

Mistura seu Liquor auri cyanureti.

Mixture or solution of cyanuret of gold.

R. Auri cyanur. gr. iij.

Aquæ alcoholisat. f.ʒviij. M.

Dose.—A tea-spoonful twice a day, gradually increasing the dose.

XXVI. AURI IO'DIDUM.

SYNONYMES. A. Ioduretum, Iodide or Ioduret of Gold.

French. Proto-iodure d'Or.

According to the French Codex, this is made by adding a solution of pure *iodide of potassium* to a solution of *chloride of gold*, collecting the iodide of gold, which falls down, on a filter, and washing it with *alcohol* to remove the excess of iodine, which precipitates with it. M. Meillet* recommends the following process in preference. To a solution of *gold* as neutral as possible is added by degrees neutral *hydriodate of ammonia* so long as a precipitate falls. The solution must not be too far diluted. A small quantity of *alcohol* must now be added, not more than about one-third of the whole volume of the liquid. After some hours' rest, this is decanted, when a precipitate of a blackish colour is obtained, composed of iodine, and iodide of gold. It is then washed by decantation with a little alcohol; when an almost white and half crystalline iodide of gold is obtained. This is dried in the open air on plates; and is kept free from light in stopper bottles. In this process, the gold is completely precipitated, which never occurs when the iodide of potassium is employed; and the iodide has an invariable composition.†

This has been used in the same cases as the other preparations of gold, in the dose of one-fifteenth to one-tenth of a grain.

* Journal de Pharmacie, Nov. 1841, p. 665.

† For another process for forming the iodide of gold, see M. J. Fordos, Journal de Pharmacie, Nov. 1841, p. 653.

XXVII. AURI NITROMU'RIAS.

SYNONYMES. Aurum Nitrico-Muriaticum, Nitromuriate of Gold.

German. Saltpetersalzaures Gold.

Nitromuriate of gold has been recommended, of late years, by Recamier, whose attention was directed to it by accident. A worker in gold had a *cancerous tumour* on the back, which, as it incommoded him, he touched frequently with the hand; this occurred whilst he was dissolving gold in aqua regia; after this the tumour soon presented another appearance, and disappeared in a short time. Recamier thought it probable, that the workman had received some of the solution upon his fingers, which had thus been applied to the tumour. Under such impressions, he employed it in the case of a female, who was affected with an *extensive cancer*; the disorganised parts resumed their natural texture, and completely healed, although the cancerous dyscrasy ultimately proved fatal. In the case of a female, with *fungus of the neck of the uterus*, a complete cure was effected by it; and in *cancer of the uterus* he found it very advantageous.

Recamier prepares it by dissolving six grains of pure *chloride of gold* in an ounce of *nitromuriatic acid*: and he applies it, like other corrosive agents, taking care to confine it to the parts to be acted upon. When the object is to cauterise, it must be applied to the affected parts, until a whitish scab or crust is formed, which falls off in three or four days; after which the application may be repeated as often as may be necessary. The pain, caused by the operation, is generally insignificant, and in cases where it is violent it can be allayed by pledgets dipped in laudanum.

XXVIII. AURI OX'IDUM.

SYNONYMES. Auri Teroxidum, Aurum Oxydatum, Oxide of Gold, Peroxide of Gold, Auric Acid.

French. Oxide d'Or.

German. Goldoxyd, Oxydirtes Gold.

Oxide of gold, prepared by calcination, is the *crocus solis* of the Wirtemberg Pharmacopœia. The oxide is received also into the Pharmacopœias of Ferrara, and Hanover.

Magendie* recommends the following as one of the modes of preparation. Take any quantity of *chloride of gold*, put it into

* Formulaire, &c.

a flask of white glass and pour upon it six or seven times its weight of *boiling water*, to dissolve the chloride; then add *crystallised baryta* gradually, until the liquid is no longer acid, as shown by a strip of litmus paper. The liquid is then boiled, permitted to cool, and filtered. The precipitate is washed several times with *warm water*; the water of the various washings is brought together and evaporated nearly to dryness; the saline mass, when cool, is then dissolved in water, and in this way more and more oxide of gold is obtained, which may be added to the other. The oxide of gold is now washed with boiling water, until the water no longer affords a precipitate on the addition of nitrate of silver. It is then washed once or twice with *water acidulated with nitric acid*, to remove the small quantity of carbonate of baryta formed during the operation, and which may remain mixed with the oxide. These washings are repeated with *cold water*, until the instillation of sulphuric acid occasions no longer any white precipitate, which indicates that it is free from baryta. The oxide is then dried at a heat of from 167° to 190° of Fahrenheit, after which it is kept in a cool and dark place in a well-stopped bottle.

The process recommended by M. Cottureau is the following: An excess of *magnesia* must be boiled with a dilute solution of *chloride of gold*, till the solution loses its colour; the whole is then to be filtered, and the precipitate well washed; the result, which is aurate of magnesia, is to be treated with an excess of *diluted nitric acid*, which removes all the magnesia, and leaves the oxide in a pure state. This is to be again well washed, and dried between sheets of bibulous paper, but without compression or exposure to light or heat.*

In the French "*Codex*" it is directed to be prepared by boiling four parts of *calcined magnesia* with one part of *terchloride of gold* and forty parts of *water*. Then wash, first with *water* to remove the chloride of magnesium, and afterwards with *dilute nitric acid* to dissolve the excess of magnesia.†

In the condition of a hydrate, the oxide of gold is of a yellow colour, but when dried of a blackish violet. It is never entirely soluble in chlorohydric acid, always leaving behind a small portion, which is reduced to the metallic state during desiccation. Neither sulphuric nor nitric acid has any action upon it.

The oxide of gold has been administered by many physicians, and especially by Westring, Niel, Chrestien, and Legrand,‡ in the same diseases as the other preparations.

* Amer. Journ. of Pharm. 2d series, ii. 110. Philad. 1837.

† Pereira, Elements of Materia Medica, 2d. edit. i. 685. Lond. 1842, or Amer. Edit. by Dr. Carson, Philad. 1843.

‡ Op. citat.

XXIX. AURUM METALLICUM.

SYNONYMES. Metallic Gold.

French. Or Métallique.

German. Metallisches Gold.

Metallic gold is either administered in the form of the *aurum limatum*, "gold filings"—formed by filing the finest gold with a fine toothed file—or in that of the *pulvis auri*, (Fr. *Or divisé*—Germ. *Goldpulver*), which is obtained by amalgamating gold with quicksilver, and driving off the quicksilver by heat.* According to Trommsdorff, a very fine gold powder may likewise be obtained by precipitating the gold from a dilute solution of the metal in *nitro-muriatic acid*, by means of *green sulphate of iron*. The precipitate, thus formed, when washed and dried, is of a brownish colour, but when polished exhibits the most beautiful golden splendour.†

It may also be prepared by rubbing leaf gold with sulphate of potassa, sifting and washing with boiling water to remove the sulphate.‡

Chrestien and Niel have exhibited metallic gold largely, and they affirm successfully; but, according to Wendt, it has no action on the economy. It is not easy, indeed, to conceive, that a substance so difficult of oxidation can have much, if any, effect. The former gentlemen and Gozzi regard it as the mildest of the preparations of gold, but as equally efficacious with the others, although more tardy in producing its effects.

Metallic gold has been administered in the dose of from a quarter of a grain to a grain, three or four times a day, in the form of powder or pill,—the dose being gradually increased: or it has been rubbed daily upon the tongue, in the quantity of from one to three grains mixed with starch powder, or the powder of lycopodium. Where the condition of the tongue and of the interior of the mouth does not admit of this, Niel advises that a blister should be applied on the side of the neck, and that the denuded surface should be dressed with a mixture of a grain of *gold amalgamated with mercury*, and half a dram of *lard*; gradually augmenting the quantity of gold to two grains. In *syphilitic ulcers* and *excoriations*, metallic gold is applied externally, amalgamated with the proper quantity of mercury, and

* Jourdan's Pharmacopée Universelle, ii. 215. Paris, 1828.

† Riecke, Die neuern Arzneimit. S. 58. Stuttgart, 1837.

‡ Pereira, Elements of Materia Medica and Therapeutics, 2d edit. i. 682, Lond. 1842; or Amer. edit. by Dr. Carson, Philad. 1843.

united with unsalted butter, lard, or cerate, in the proportion of twelve grains to one ounce. In *syphilitic excrescences*, frictions with gold powder, mixed with the saliva, are said to have been serviceable.

The following formulæ are given by Riecke :*—

R. Auri pulv. gr. vj.
Amyli. gr. lxxj.
M. f. pulv. in part. xij. æquales divid.

A powder to be given four times a day.

R. Auri pulv.
Lycopod. ãã gr. ij.
M. f. pulvis.

A powder to be rubbed once a day upon the tongue.

XXX. BAL'LOTA LANA'TA.

SYNONYMES. Leonurus Lanata.
German. Wolliger Wolfstrapp.

This plant belongs to the NATURAL FAMILY, Labiatae; SEXUAL SYSTEM, Didynamia Gymnospermia. It grows exclusively and commonly in Siberia, in dry mountainous regions.

In its native country, it has been long administered as a powerful diuretic, especially in *dropsy*. Both Gmelin and Pallas refer to it in this respect in their travels in Siberia. Within the last few years, its use has extended elsewhere; and it is now frequently employed in Russia, Germany, and Italy. It is said to be often adulterated with *leonurus cardiaca*, *ballota nigra*, and *marrubium*;† and it is important, that the genuine Siberian plant should be used, as the observations of Brera have shown the cultivated plant to be very powerless. For medicinal purposes, the whole plant has been employed, with the exception of the root.

The diseases, in which *ballota lanata* has been administered

* Die neuern Arzneimit. S. 59. Stuttgart, 1837.

† Schmidt's Jahrbuch der in und ausländisch. gesammt. Medicin. B. iv. S. 275, and Riecke, Op. cit. S. 68.

abroad — for it has not been employed in this country — are the following: —

1. *Dropsy*.—Rehmann prescribed it several times with decided advantage; and where organic disease prevented the cure, the urinary secretion was always largely augmented by it. The chemical condition of the urine was likewise strikingly changed during its use: at first, it was whitish, afterwards darker, and ultimately almost black or of a deep brown, like the darkest beer. At times, according to Rehmann, when the accumulation of fluid was pretty well removed, a pain would occur in the hypochondres, indicating that its use should be laid aside. Schilling, in Werchny-Udinsk, asserts, that he cured several cases of dropsy by it. Rupprecht and Muhrbeck administered it with the best effects, and Brera* found it extremely serviceable in hydropic conditions, especially where they had been preceded by, or were complicated with, rheumatic or gouty affections. Luzzato prescribed it with equal success; and Heyfelder, who gave it according to the prescription of the Russian physicians, observed the urine to be of a blackish-yellow hue at the commencement, and afterwards of a very dark colour. He found, however, that to keep up the diuresis it was requisite to combine it with other diuretics, or to change it for other agents.

2. *Rheumatism and Gout*.—In these diseases, ballota is administered in Siberia. Brera, as well as his compatriots, Ghidella, Fontebuoni and Luzzato, have tested its efficacy by repeated trials. The pains generally soon disappeared under its use, and a cure took place without a relapse.

3. *Adiposis*.—In a case of this kind, it was exhibited in St. Petersburg by Dr. Weisse. The fatness was inordinate, and the remedy acted most favourably. It did not, however, occasion diuresis, but under its use a hemorrhoidal flux returned, which had previously been arrested.

MODE OF ADMINISTERING.

Docoction is the best form for administering the plant; from ʒss. to ʒij. to ʒviij. of water; — this portion to be divided into two halves, and to be taken in the course of the day. Rehmann boils ʒiss. to ʒij. of the coarsely powdered plant in Oij. of water down to half; to which he adds, according to circumstances, some diffusible excitant or a few drops of laudanum. Of this mixture, he directs a cupful to be taken morning and evening, gradually increasing the dose.

* *Antologia Medica*, No. 2. febbrajo, 1835.

XXXI. BARIUM IODIDUM.

SYNONYMES. Barium Iodatum, Iodide of Barium.

German. Iodbaryum.

In solution, Baryta Hydriodas, Hydras Barii Iodati, Baryta Hydriodica, Hydriodate of Baryta.

German. Iodwasserstoffsäure Schwererde; Hydriodsaure Baryt.

This preparation has been introduced recently.

MODE OF PREPARING.

Iodide of barium is obtained by boiling *baryta earth* in a solution of *iodide of iron* in water, (made by taking one part of pure iron filings, and four parts of iodine, pouring upon them from six to eight parts of water, agitating frequently and applying warmth gently until the fluid appears clear and almost colourless,) or, what is cheaper, by boiling the solution of *iodide of iron* with *carbonate of baryta*, which must be added in small portions as long as there is any effervescence.

The fluid obtained by either process, after filtering, must be clear and neutral, and yield no bluish or blue precipitate with the ferrocyanuret of potassium; should it yield a precipitate, the decomposition of the salt of iron is incomplete. Should the solution, formed in the first manner, have an alkaline reaction, the excess of baryta must be removed by exposing the mixture to the air, whereby it becomes converted into a carbonate, and falls to the bottom. The solution is then evaporated until a pellicle forms, the heat being gentle; the crystals are placed quickly between printing paper, and kept in a well-stopped glass vessel. They form white radiated plates, which easily deliquesce in the air, and on that account cannot be prescribed in the form of powder, but may be dissolved in some aromatic water.

EFFECTS ON THE ECONOMY.

Jahn instituted several experiments with iodide of barium, on plants, on animals, and on man in a state of health and disease. In considerable doses, it acts as a poison on the organism, and as one of the acrid class. Administered in very small doses, and with great circumspection, he found it to be

serviceable in *scrophulous and similar morbid conditions*, and as an alterative in *morbid growths, hypertrophy, chronic inflammation*, &c., in which conditions it proved equally useful with chloride of barium, mercury, or iodine.* Jahn's observations did not, however, lead him to speak positively regarding its advantages or defects; and he adds the caution—"Cautè, per Deos, incede, latet ignis sub cinere doloso." Jahn's observations were published in 1830, and, according to Riecke, he has been since silent on the subject. Rothamel administered the iodide in a desperate case of *scrophula*, occurring in a patient twenty-one years of age, with great success. He began with one-eighth of a grain three times a day, and increased the dose gradually during a protracted administration of the article, until three grains were taken four times daily.

Biett has administered it frequently in cases of *scrophulous swellings*, and at times externally, according to the following form:—

Unguentum barii iodidi.

Ointment of iodide of barium.

R. Barii iodid. gr. iv.

Adipis, ʒj. M. fiat unguentum.

XXXII. BERBERI'NA.

SYNONYMES. Berberinum, Berberine, Berberin.

German. Berberin.

The inner bark of *Berberis vulgaris* is of a yellow colour, and a bitterish, somewhat astringent, taste. It is cathartic, and was formerly used in *jaundice*; originally, perhaps, in consequence of the "signature" of the yellow colour.† In more modern times, it has been again recommended in the same disease on the faith of experiments.‡

The bitter principle of the root was discovered a few years ago by Buchner and Herberger, and its properties have been investigated by Brandes.§ Buchner first recommended, at a meeting of the German Association of Naturalists and Physicians in the year 1834, that it should be received into the *Materia Medica*; but hitherto few experiments have been made with it.

* Riecke, Op. cit. S. 71.

† Ray's *Historia Plant.* ii. 605.

‡ Lond. Med. Repos., new series, i. 38.

§ Archiv. der Apotheker Vereins, ii. 29.

METHOD OF PREPARING.

An *alcoholic extract of the root* of berberis vulgaris is prepared, to which *water* is added. This throws down a pulverulent brown substance; the fluid is poured off; and the substance dried; it is then treated with *alcohol*, which takes up the berberin, leaving a small portion undissolved. By evaporating the alcohol, the berberin remains.*

Thus prepared, berberin resembles an extract: it is of a brownish-yellow colour, translucent, and smells like the root; its taste is a pure bitter, and it becomes soft in the air. Buchner† succeeded in obtaining the bitter principle pure, and in a crystalline form. Its reaction is neither alkaline nor acid; it is soluble in alcohol and water, but not so readily in the latter as in the former. When crystallised, it requires 600 parts of water for its solution; whilst in alcohol, at a medium temperature, it is soluble in 100 parts. It approximates the alkaloids in its nature, as with certain acids it forms crystallisable compounds. It is not soluble in ether. The brownish-yellow solution formed by it is turned of a reddish-brown by alkalies, like the infusion of rhubarb, and acids restore the colour.

EFFECTS ON THE ECONOMY.

According to Buchner, no injurious consequences are to be apprehended from the administration of berberin as a therapeutical agent: of this he had an opportunity of satisfying himself both on his own person and on others. When labouring under *indigestion*, he took it with the best effects; not only was the dyspepsia removed, but also a yellow hue of the skin which had previously existed. He recommends it, therefore, as an excellent stomachic, especially when there is *disturbance of the functions of the liver*. In doses of two, five or ten grains, it only aids the appetite, but in larger doses — fifteen to twenty grains — it acts upon the bowels without inducing tormina, and therefore not as a drastic.

Within the last few years, Koch has published some observations on the use of the berberin. He treated several cases with it as prepared by Buchner himself, when he found all his results confirmed, and that it merited a high rank amongst bitter agents.

* Riecke, Op. cit. S. 442.

† Journal de Pharmacie, xxi. 309, and Philadelphia Journal of Pharmacy, vii. 328. Philadelphia, 1835.

He gives two cases of marked disturbance of the digestive function, in which the berberin afforded essential service.

XXXIII. BIGNONIA CATAL'PA.

SYNONYMES. Catalpa, Catalpa Cordifolia, C. Arborescens, C. Arborea, Catalpa or Catawba Tree.

Bignonia Catalpa belongs to the NATURAL FAMILY, Bignoniaceæ; SEXUAL SYSTEM, Didynamia Angiospermia. It is a tree well known in this country, but is not applied to any medicinal use.

According to Kämpfer and Thunberg, the Japanese physicians consider the pods (*Siliquæ*) to be a powerful remedy in different *asthmatic affections*. This gave occasion to several Neapolitan physicians — and especially to Professor Antonucci — to institute experiments in reference to its virtues, and their report was decidedly favourable. Brera also extols it in *asthma*.

As to the precise mode in which it acts, we have no exact information. Dierbach and Richter, according to Riecke,* place it amongst the Acria; whilst, according to the analysis of Grosso,† it seems more probable that its active principle is of a fatty nature, resembling the butter of the cacao. It is extremely probable, that it possesses no other virtues than those of a simple demulcent, and that the properties ascribed to it have been mainly, if not wholly, derived from the substances associated with it. Brera, for example, administered it with the following additions :‡ —

R. Siliquar. catalp. ℥ss.
Aquæ fontan. q. s. ad colatur. ℥viij.

Adde

Oxymel. scillæ, ℥ss.

Or

R. Siliquar. catalp. ℥ss.
Senegæ rad. ℥ij.
Aquæ fontan. q. s. ad colatur. ℥viiij.

Adde

Oxymel. scillæ, ℥i.

To be taken by little and little.

* Op. cit. S. 72.

† Gazette Médicale de Paris, 1834, p. 8.

‡ Ricettario Clinico, Pad. 1825.

XXXIV. BOLETUS LA'RICIS.

SYNONYMES. *Boletus purgans*, *B. albus*, *Agaricus albus*, *Fungus Laricis*, *Polyporus officinalis*, Fungus of the Larch, White Agaric.

French. Agaric blanc.

German. Lerschenschwamm.

This fungus grows on the stem and larger branches of the larch. Formerly, it was administered as a cathartic, but in this respect it has become obsolete. Still, it is retained in many pharmacopœias; for example, in those of Amsterdam, Bavaria, Brunswick, Paris, Ferrara, Geneva, Hamburg, Hanover, Oldenburg, Poland, Prussia, Saxony, Sweden, Wirtemberg, and Wurzburg. Recently, it has been administered frequently in the *colliquative sweats of phthisis*. Barbut, of Nismes, made many trials with it,* which were favourable; and the experience of Andral was similar.† More recently, however, he has expressed the opinion, that no great advantage has been derived from it.‡

By several of the German physicians equally advantageous results have been obtained — as by Toel and Trauttsch — so that, according to Riecke§ it deserves, perhaps, to be better known and investigated. Recently, Kopp has added his testimony in its favour.||

Formerly, as a cathartic, half a dram to a dram of the powdered boletus was given. In profuse diaphoresis it is administered in doses of from two to six grains. This dose, repeated for a few evenings, according to Barbut, arrests the sweating, which, Riecke thinks, is effected through its revellent excitation of the abdominal nerves; for which reasons he suggests, that the propriety of the union of opiates with it, to prevent its purgative effect, may be questionable.

Kopp gives it in the dose of three grains, morning, noon, and night. If it acts upon the bowels, which is rarely the case, the dose must be diminished.

* Burdach, in *Journal der Praktisch. Heilkund.* von Hufeland, Mar. 1830.

† *Journal de Pharmacie*, vol. xx.

‡ *Cours de Pathologie Interne*, &c., recueilli et rédigé par A. Latour, p. 157. Edit. de Bruxelles, 1837.

§ *Op. cit.* S. 73.

|| *Denkwürdigk. in der ärztlich. Praxis.* Frankf. 1836, S. 344, cited by Riecke.

*Pilulæ boleti laricis eum opio.**Pills of white agaric and opium.*

R. Bolet. laricis, gr. xv.

Extract. opii, gr. iiss. M.

Divide in pil. vj.

One or two at bed-time in the colliquative sweats of phthisis.
*Rayer.**

XXXV. BRAYERA ANTHELMINTICA.

This plant is a native of Abyssinia, and belongs to NAT. ORD. Rosaceæ Sanguisorbeæ (*Decandolle*), SEX. SYST. Icosandria Digynia. It was first taken from Abyssinia to Europe by Dr. Brayer, from whom it received its name. The flowers are the parts used in medicine, and they yield, on examination, an extractive matter, containing tannic acid, which is most readily taken up by hot water; and consequently, the decoction is the best preparation.

In Abyssinia, the flowers of brayera are said to have been employed with the greatest success in *tapeworm*, but in Europe, no experiments had been made with them until Dr. Plieninger, having become acquainted with a missionary from Abyssinia, and heard his description of their wonderful effects, obtained some of them from him,† which he submitted to his friend, Dr. Kurr, who detected, on examination, the principles above mentioned.

With the rest of the flowers, Dr. Plieninger made trial in two cases. He took a handful of the *blossoms*, about ʒj. or ʒiiss. and boiled them in ʒxvi. of *water* down to one half, adding to the strained liquor as much *honey* as counteracted, in some measure, the objectionable taste. This decoction was taken by a delicate woman, about 30 years of age, who had previously taken the *extractum filicis maris* in pilular form, according to Peschier's plan, without success. In the course of the day, she passed numerous fragments of *tænia*, mixed with mucous discharges, without experiencing any striking inconvenience from the remedy. From this time, she remained free from the parasite.

A robust man, 38 years of age, who had taken large quantities

* A. Bouchardat, *Annuaire de Thérapeutique*, p. 8. Paris, 1842.

† Riecke, *Op. cit.* S. 73.

of tartrate of antimony and potassa in consequence of violent inflammation of the lungs, — whilst he lay sick of this disease, discharged a great many portions of tænia, without having previously experienced any inconvenience from the presence of the entozoon. In July, 1834, he took the same decoction. Since then, he has had no appearance of the tænia in his evacuations.

Although but few cases have occurred in which brayera has been administered in European practice, Dr. Plieninger considers, that it is a valuable addition to the materia medica, inasmuch as it can be administered to delicate persons and children, without violence being done to the whole organism, as is the case with many of the true anthelmintics. The article has not been imported in sufficient quantities into Europe to admit of the necessary trials for fully testing its efficacy. In this country — so far as the author knows — it has not yet been seen.

XXXVI. BRO'MINUM.

SYNONYMES. Bromium, Brominium, Bromineum, Muride, Bromine.

French. Brome.

German. Brom.

This elementary substance was discovered in 1826, by Balard, of Montpellier. In its chemical properties it is allied to chlorine and iodine; — to the former, according to a recent writer,* more than to the latter. Balard detected it whilst occupied in some investigations on the water of saltponds, and gave it the name bromine — from βρωμος, “a stench or smell” — on account of its disagreeable odour. It is met with chiefly in sea water, and in certain animal and vegetable substances that live therein. It has likewise been found in many mineral waters, of this and other countries, and especially in salt springs — as in those of Salina, by Professor Silliman, and of Kenawha by Professor Emmet.

It is in the secondary list in the Pharmacopœia of the United States (1842).

METHOD OF PREPARING.

Balard's mode of preparing bromine consists in passing a current of *chlorine* through *bittern*, after which *ether* is added, and the two liquids are strongly agitated. The chlorine decomposes

* Dr. Glover, Edin. Med. and Surg. Journ., July, 1842.

the bromide of magnesium — the form in which bromine exists in the bittern — and converts the bromide into a chloride of magnesia, setting the bromine free. The ether dissolves the evolved bromine, the mixture assuming a hyacinth-red colour. The ethereal solution is agitated with *caustic potassa*, by which bromide of potassium and bromate of potassa are generated; the ether becoming colourless and pure, and fit to be used for dissolving fresh portions of bromine. When a sufficient quantity of the bromide has been obtained, it is mixed in a retort with *peroxide of manganese*, and acted on by *dilute sulphuric acid*, by which the bromine is given off. The sulphuric acid sets free hydrobromic acid, which, at the moment of its disengagement, is deprived of its hydrogen by the oxygen of the peroxide of manganese, and is thereby converted into bromine. The bromine passes over in reddish vapours, and is made to condense under water, contained in an appropriate receiver.

M. Bussy* prefers the following form. The mother waters of *kelp* (*Soude de Varecq*), after iodine has been precipitated from them by means of chlorine, contain bromine in the state of a metallic bromide, when care is taken to add no more chlorine than is required to precipitate all the iodine. To 1250 parts of these *mother waters*, 32 parts of *peroxide of manganese* in powder, and 24 of *common sulphuric acid* at 66° are added. The mixture is then put into a tubulated glass retort, to which a tubulated receiver is adapted, and to the latter a tube, which dips into a flask. The retort and receiver, as well as the tube, must be ground so as to fit accurately without lutes or corks, which would be destroyed by the chloride.

Everything being arranged, the retort is heated until the liquid is made to boil, when the bromine condenses in the receiver under the form of red oily striæ with a small quantity of water. The operation must be arrested when the red vapours cease to be produced. By slightly heating the receiver, without dismounting the apparatus, the bromine may be made to pass over into the flask, in which it will condense on cooling.

The mother waters used in this preparation should not be rejected, until it is evident, on the addition of a fresh quantity of sulphuric acid and oxide of manganese, that they contain no more bromine.

Bromine, at the ordinary temperature, is a fluid of a blackish-red colour, when regarded in quantities, — but of a hyacinth-red when placed in a thin layer between the eye and the light. Its smell is strong and disagreeable, resembling that of chlorine. Its taste is strong. It colours the skin yellow — the colour gradually disappearing of itself. Its specific gravity is 2.966. It is

* Journal de Pharmacie, Janvier, 1837.

readily set free; and, when volatilised, assumes the form of dark red vapours. It boils at 117° ; is sparingly soluble in water, and the solution is of a yellow colour. It is more soluble in alcohol, and still more so in ether. In its chemical relations with other bodies, bromine, as before observed, resembles chlorine and iodine; but chlorine appears to have more power, and iodine less, than bromine, as bromine is separated from all its combinations by chlorine, whilst it decomposes the compounds of iodine, and assumes the place of the latter. It forms acids both with oxygen and hydrogen.

EFFECTS ON THE ECONOMY IN HEALTH.

Experiments have been instituted to discover the influence of bromine on the animal economy, and especially by Barthez.* In this respect, also, bromine resembles iodine, and, like it, belongs to the class of irritant poisons. Twelve grains of bromine, dissolved in water, and injected into the jugular vein of a dog, destroyed it almost instantaneously. Cough ensued; the respiration and circulation were accelerated; the pupils dilated; the male organ was erect; and these signs were followed by involuntary discharge of the excrement, and at times stiffness of the upper and lower extremities. On dissection, Barthez found the cavities of the heart full of coagulated blood, and the lungs gorged with the same fluid; in the *venæ cavæ* there were dark coagula; and, in the stomach and intestines, small, bloody, blackish cylinders, similar to sticks of lunar caustic.

The same quantity introduced into the stomach caused death in three or four days, when the *œsophagus* was tied; when, however, the animal was able to vomit, fifty to sixty drops were requisite. The poison acts less intensely when it is given in conjunction with aliment; it produces coughing, excitement, nausea and vomiting: constant sucking of the tongue was noticed, with frequently extraordinary restlessness and anxiety, and debility gradually augmenting until death. On opening the body the stomach has been found contracted; the mucous membrane wrinkled, at times softened, and frequently the seat of roundish ulcerations of an ashy-green colour. Near the pylorus, Barthez found black spots, which could be readily scraped off with the back of the scalpel, and left gangrenous ulcers exposed. Barthez recommends magnesia as an antidote to bromine, but he rests his recommendation on a single observation only. Butzke obtained similar results from his experiments. In one

* *De l'Action du Brome, &c.* (Thèse) Paris, 1828. See, also, Fournet, in *Bulletin Général de Thérapeutique*, Février, 1838.

case, only, in which a dog died a few hours after a dose of three drams of bromine, he found the intestines unchanged, and death could only be ascribed to the paralysing influence of the poison on the nervous system.*

Two series of effects, according to Dr. Glover, are produced by the introduction of bromine in large doses into the stomach : one arising from volatilized bromine getting into the fauces and air-passages ; and the other from its corrosive and irritant action on the stomach and intestines. Another series, he conceives, may be due to its entrance into the circulation.

It appears to be more irritant when diluted than when pure.

The vapours of bromine do not seem to exert any organic influence on the workmen who prepare it.†

EFFECTS ON THE ECONOMY IN DISEASE.

Pourché first used both pure bromine and hydrobromate of potassa for therapeutical purposes. He found it very efficacious in *scrophula*, especially in dispersing *strumous swellings*, both when given internally and applied externally.‡

In a case of very large *goître*, it was highly serviceable. According to Pourché's observation, it excited heat in the face, headach, dryness of the throat, &c., which, however, soon disappeared. Pourché gave bromine internally, diluted with forty parts of distilled water, beginning with five or six drops of this mixture, and gradually raising the dose. It has also been added in a dilute state to lotions and cataplasms. The remedy is not, however, much used.

Magendie frequently administered bromine, but more commonly some of its preparations. He prescribed it in cases in which iodine did not appear to exert the proper efficacy, or where the patient had become accustomed to its use. The chief diseases in which he used it were *scrophula*, *amenorrhœa*, and *hypertrophy of the ventricles of the heart*.

More recently, it has been administered by M. Fournet,§ in cases of *chronic arthritis*, both internally and externally ; but his facts, as he himself remarks, were too few to enable him to deduce any general conclusions as to the therapeutical value of the remedy in those affections. He always gave it in a pure state, in the form of mixture, with a solution of gum : externally, it was applied in the form of alcoholic mixture to the affected joints.

* Christison on Poisons, 3d edit. p. 186.

† A. Chevallier, *Annales d'Hygiène Publ. &c.* Avril, 1842.

‡ Bulletin Général de Thérapeutique, No. 14. Juillet 30, 1837.

§ Ibid. Février, 1838.

The dose was at first two drops in four ounces of the vehicle ; and it was gradually increased by two drops at a time, until as much as sixty drops were given in the twenty-four hours.

The ALCOHOLIC MIXTURE, used by M. Fournet as an external application, consisted, at the commencement, of ten drops of bromine to an ounce of *alcohol*: this was augmented daily by five drops until it reached one hundred and twenty drops.

Dr. Glover* considers the solution of bromine in water an elegant and useful application in *scrophulous, syphilitic, and specific ulcers*, as well as in *eczematous eruptions*. He gives a case of obstinate *tuberculous eruption*, where an ointment of bromine and hydrobromate of potassa, eight minims of bromine, and half a dram of the hydrobromate to an ounce of lard, effected a cure ; and, also, a case of *sarcomatous tumour of the knee* removed by a similar but stronger ointment.

Dr. Glover considers, that, physiologically, bromine and the bromides are nearer the group of chlorine and the chlorides, than that of iodine and the iodides. He maintains, that the chemical and physiological relations are alike, and that the same is true of the medicinal properties.†

The preparations of bromine are described in other parts of this volume.

XXXVII. BRU'CIA.

SYNONYMES. Brucina, Brucinum, Brucium, Vomicina, Brucine.

This alkaloid was discovered by Pelletier and Caventou, in 1819, in the bark of the false angustura (*Brucea antidysenterica*). It is found also in small quantities in nux vomica, and in St. Ignatius's bean.

METHOD OF PREPARING.

An alcoholic extract of *false angustura bark* is prepared, which is dissolved in a large quantity of cold water, and filtered, in order to separate the fatty matter. The colouring matter is precipitated by *acetate of lead*, the excess of this is thrown down by sulphuretted hydrogen gas, and the brucia by an *alkaline base*, for which purpose *magnesia* may be employed. The pre-

* Edinb. Med. and Surg. Journal, Oct. 1842.

† Ibid., and Lond. and Edinb. Monthly Journal of Med. Science, Nov. 1842, p. 1011.

precipitate from the magnesia is then washed, dried, and treated with *alcohol*, which lays hold of the brucia ; this is obtained by evaporation. As brucia is somewhat soluble, the precipitate ought not to be washed too much. Brucia, thus obtained, is coloured, but it may be procured colourless by forming an oxalate of brucia, and treating it with a mixture of equal parts of alcohol and ether. The oxalate is thus deprived of its colouring matter ; after which it is decomposed by magnesia : brucia is thus obtained wholly pure and devoid of colour.

Pure brucia is of a white colour, and forms regular crystals in the form of oblique prisms, having a base representing a parallelogram ; it has a pearly lustre, tastes very bitter, and is soluble in 500 parts of boiling water, and in 850 parts of cold. In alcohol it dissolves readily, from which solution it is obtained in the crystalline form. When exposed to the influence of heat, it melts at a temperature very little above that of boiling water. At a higher temperature, it is decomposed, and affords the same products as vegetable substances that do not contain azote. With the acids, brucia forms neutral salts, which differ from the salts of strychnia. The sulphate of brucia crystallises in very fine needles, and resembles the sulphate of morphia, but it has a much more bitter taste. Nitrate of brucia does not crystallise, which constitutes an essential difference between brucia and strychnia. With an excess of nitric acid, the salt has a beautiful pearly (*nacre*) aspect.

EFFECTS ON THE ECONOMY.

Brucia acts energetically on the animal economy in the same manner as false angustura, but much more strongly. It is similar, in its operation, to strychnia, but is considered to be weaker in the proportion of one to ten, according to Pelletier ; one to twelve, according to Magendie ;* and one to twenty-four, according to Andral.† It requires four grains to kill a rabbit, whilst half a grain of strychnia is sufficient. A tolerably strong dog, to which three grains of brucia had been given, was affected with symptoms resembling tetanus, but did not die.

Pelletier is of opinion that brucia, or rather the alcoholic extract of false angustura, might be substituted in practice for the extract of nux vomica ; its operation is nearly the same, whilst there is no danger of its acting too violently.

Andral has frequently prescribed brucia, and his deductions are, that it is far more under our control than strychnia. Like

* Formulaire, &c. des Nouveaux Médicaments, &c.

† Journal de Physiologie de Magendie, iii. 267, Juillet, 1823.

strychnia, it has been given in cases of *paralysis* with varying success. It would appear to have acted most beneficially in that resulting from lead poisoning. Magendie administered it with success in two cases of *atrophy*, one of the leg, and the other of the arm.

MODE OF ADMINISTERING.

Brucia, according to Magendie, may be given either in pills or tincture, gradually augmenting the dose. Andral raised it from half a grain to five grains. Magendie recommends, that the alkaloid should always be that obtained from false angustura; the brucia of nux vomica being mixed with a portion of strychnia, which adds to its activity, and renders it difficult to determine the dose. The following formulæ are recommended by him:—

Pilulæ bruciæ.

Pills of brucia.

R. Bruciæ pur. gr. xij.
Confect. rosæ, ℥ss. M. exactiss. et fiant pilulæ xxiv.

One pill to be begun with — twice a day.

Tinctura bruciæ.

Tincture of brucia.

(French, *Alcool de Brucine*.)

R. Alcohol (36° Aréom., s. g. 847), f. ℥j.
Bruciæ, gr. xvij. M.

Of this tincture, from six to twenty-four drops may be given, in the form of mixture, in any vehicle.

Mistura bruciæ.

Mixture of brucia.

(*Potio Stimulans*.)

R. Bruciæ, gr. vi.
Aquæ destillat. f. ℥iv.
Sacchar. ℥ij. M.

Dose. — A table-spoonful night and morning. *Magendie.*

XXXVIII. CAIN'CÆ RADIX.

SYNONYMES. Rad. Chiococcæ, R. Cainanæ, R. Caninanæ, R. Cahincæ, R. Kahincæ, R. Serpentariæ Braziliensis; Cainca Root.
Portuguese. Raiz Crusadinha, R. Preta.
German. Caincawurzel.

The plant, which furnishes the root introduced into Europe of late years, and which has since become known as a remedial agent, is *Chiococca anguifuga*, of the FAMILY Rubiaceæ, SEXUAL SYSTEM, Pentandria Monogynia.* The shrub grows wild in the forest of Brazil, especially in the province of Minas Geraes, and the root is used there against the bites of serpents. This root is of the thickness of the finger, round, and knotty; the surface smooth or irregularly wrinkled; the wood tough and of a whitish colour; the smell disagreeable, especially that of the fresh root; and the taste at first like that of coffee, but afterwards nauseous and pungent. The bark of the root alone possesses efficacy, the woody portion having no action. The bark separates readily from the wood; it is thicker on the root itself than on its branches; and, on the outside, is of an amber, or brownish yellow green colour; yellower and brighter on the youngest parts; the epidermis is not easily separated. According to the chemical investigations of Pelletier and Caventon,† the following are found to be the constituents of the bark:—

1. A bitter principle, crystallisable in small, white, silky, shining needles; inodorous, and very soluble in hot alcohol, which communicates to the whole plant a degree of astringent bitterness, and at the same time has an acid reaction on litmus paper. In order to separate this acid, which has been termed by those chemists *Acidum cahincicum*, in a pure state, the alcoholic extract of the root must be dissolved in water, filtered, and precipitated by lime, until the fluid loses all bitterness; the precipitate is then decomposed by oxalic acid, and boiling alcohol; or the acetic, or muriatic acid may be dropped into an aqueous decoction of the bark of the root, and, in the course of a few days, the acidum cahincicum will separate in the form of small crystals. With cahincic acid, prepared in this way, however, some colouring matter is still united. 2. A fatty, green, nauseous smelling substance, which communicates to the plant its smell. 3. Yellow colouring matter; and 4. A viscid colouring matter.‡

* Art. Chiococca, in Encyclopäd. Wörterb. vii. 521. Berl. 1831, and Von Martius, Spec. Mat. Med. Brasil, i. 18.

† Journal Général de Médecine, Mai, 1830, and Phil. Journ. of Pharmacy, iii. 165. Philad. 1831.

‡ Journal de Pharmacie, xvi. 465.

EFFECTS ON THE ECONOMY.

The effect of cainca root seems to be especially exerted on the *digestive* and *urinary organs*. It occasions watery evacuations, and diuresis. From the experiments, however, of Albers,* made on a great number of dropsical patients, in the Charité at Berlin, he was induced to deny its diuretic powers, and to place it amongst the drastic purgatives, by the side of helleborus niger. Wolff was of the same opinion. According to Von Langsdorff,† it is a highly efficacious emmenagogue, possessing also — to use his own language — considerable resolvent virtues, and hence employed in *dropsies, that are connected with obstructions in the abdomen*. Riecke,‡ asserts, that he had occasion to employ it in two cases of *ascites* complicated with induration of the liver. He had no expectation of effecting a radical cure, but it afforded no palliation; diuresis was not excited, whilst nausea, colic, and diarrhœa supervened, so that he discontinued it: he gave it in decoction. Others have observed the same inconvenience from its use, or have found it wholly ineffectual; for example, B. Heyfelder, Reinhardt, Bartels,§ and others. Riecke suggests the possibility, in these cases, of adulteration of the drug. On the other hand, cainca has been highly extolled by François, Ribes, Wagner, Solieer, Löwenstein,|| &c., but particularly by Von Langsdorff.

The main diseases in which cainca is recommended, are, 1. *Dropsies*, in which many favourable trials have been made by Von Langsdorff, Spitta,¶ Guddoy, Engler, François, Wagner, Solieer, Robredo,** &c. 2. *Intestinal worms*, against which it appears to act like other drastics. 3. *Obstructed menstruation*: on this subject, however, farther trials are needed. When it operates as an emmenagogue it is probably altogether like cathartics that act more especially on the lower part of the bowels, that is, by contiguous sympathy. 4. M. François has recommended it highly in *catarrhus vesicæ*, but the experience of others has not confirmed this.†† It may be mentioned, that in its native country it is used for *rheumatic pains*; in a peculiar

* Medicin. Zeitung. No. iv. Sept. 1832.

† Hecker's Litter. Annal. B. iv. S. 395, and Rust's Repertorium, B. xiv. S. 458.

‡ Die neuern Arzneimittel, u. s. w. S. 84. Stuttgart, 1837.

§ Gräfe und Walther's Journal der Chirurgie, u. s. w. xxiv. S. 470. Berlin, 1836.

|| De radice Caincæ ejusque in morbis hydropicis virtute. Berol. 1828.

¶ Hecker's Litterar. Annal. iv. 396.

** Journal de la Academia de Medicina de Méjico. Oct. 1836, and Brit. and For. Med. Review, p. 562, Apl. 1838.

†† Bulletin Général de Thérapeutique, No. 13, Juillet, 1837.

kind of *pica* experienced by the negroes of South America; and, as already remarked, against the *bites of serpents*.

MODE OF ADMINISTERING.

Cainca is given in various forms — POWDER, INFUSION, and DECOCTION; and, besides these, a TINCTURE and an EXTRACT have been made of it. A SYRUP and a WINE have also been recommended. To form the latter, one ounce of the *powdered root* is infused in a pint of *wine*; the tincture is made with one part of the *root* and eight parts of *alcohol* at 20°. The ALCOHOLIC EXTRACT is considered to be the most uniform in strength, and has, therefore, been preferred by many. The SYRUP is formed by dissolving ʒiiss. of the *extract* in a little *alcohol*, mixing this with a pint of hot *simple syrup*, and allowing it to boil for some time, in order that the alcohol may evaporate. The dose of the powder is from ʒi. to ʒss. in the twenty-four hours. It appears, however, to be the most objectionable form, and to give rise to unfavourable symptoms more frequently than the others. Opinions vary as to whether the infusion or the decoction should be preferred. According to Caventou and Pelletier, boiling extracts very well the efficacious parts of the root, and there are cases in which the decoction has rendered essential service after the infusion had been administered without success. Of the decoction, from f.ʒj. to f.ʒiij. are given in the day. Of the extract, the dose, in the twenty-four hours, is from twenty to thirty grains; of the tincture f.ʒj. to f.ʒij.*

The decoction, used by Spitta and others, was made as follows:

Decoctum radicis caincæ.

Decoction of cainca root.

R. Rad. caincæ, ʒij.

Coque cum aquæ Oiss. ad dimidiam partem, et cola.

Dose. — A table-spoonful three times a day.

Von Langsdorff.†

By others, the following form has been employed:

R. Rad. cainc. ʒj.

Aquæ, Oij.

Coque ad dimidiam partem et cola.

Dose. — Two table-spoonfuls three or four times a day.

Engler.

* Journal de Chimie Médicale, Mai, 239-242. Paris, 1827.

† Hufeland und Osann's Journ. B. lxii. St. 2.

Dr. John H. Griscom,* of New York, considers there is a remarkable analogy between cainca and apocynum cannabinum.

The *Acidum cahincicum*, described above, is said to possess tonic, cathartic and diuretic powers, and has been used successfully in some cases by François, in the dose of six grains gradually increased to fifteen.

XXXIX. CALEN'DULA OFFICINA'LIS.

SYNONYMES. Calendula Sativa, Caltha Sativa, Verrucaria, Chrysanthemum, Sponsa Solis, Single Marigold, Garden Marigold.

French. Souci, S. Ordinaire.

German. Ringelblume.

This plant belongs to FAMILY Synanthereæ, SEXUAL SYSTEM, Syngenesia Necessaria. It is much cultivated in the gardens of southern Europe more especially, and grows wild there. The whole plant has a feeble aromatic smell, which is not, however, unpleasant. The taste is bitter and somewhat pungent. It was examined chemically by Geiger and Stoltze,† who found in it a peculiar glutinous matter, readily soluble in alcohol, insoluble in ether, and in ethereal or volatile oils, and but little soluble in water: to this they gave the name *calendulin*.

EFFECTS ON THE ECONOMY.

The term *officinalis* indicates, that the calendula was formerly received into the lists of the Materia Medica as an "official;" but it had become entirely obsolete when Westring,‡ a Swedish physician, in 1817, recalled attention to it. He recommended it particularly in cases of *cancer of the breast and uterus*, having noticed its good effects by accident. Visiting an aged female, who had suffered, for a long time, under an extremely painful

* Amer. Journal of the Medical Sciences, for May, 1833, p. 55.

† Berlin. Jahrb. d. Pharmac. B. xxi. S. 282.

‡ Erfahrung über die Heilung der Krebsgeschwüre, u. s. w. Translated from the Swedish into German by K. Sprengel. Hal. 1817.

induration of one mamma, he found she was able to allay the burning pain by the application of the fresh plant. This induced him to try it in several cases of *cancer*, and from the results he was led to infer, that it is perhaps the best agent that can be employed in that frightful malady. He never, however, employed it alone, but associated with it other active remedies, so that but little attention was paid to his recommendation; — a great portion of the efficacy of the agents employed, being — it was thought probable — ascribable to the associated articles.

Some time after Westring's publication, the remedy was used by others, when his observations were confirmed. Rudolph* employed it with advantage internally, in a case of *induration of the mammæ* in a young female; but the acetate of iron was at the same time applied externally in solution. Fehrt found it highly useful not only in incipient, but in advanced *scirrhus*. Stein praises it in *cancer of the integuments (hautkrebs)*. He forms the expressed juice of the young plant and flowers into an ointment with fresh butter, and applies it once or twice a day by means of lint, having previously washed the ulcers with a decoction of the plant. Internally, the calendula is prescribed in the form of *decoction*, made with milk or water, or of a *mel-lago* prepared from the fresh juice, dissolved in an aromatic water; or made into pills. When the salve is applied, a sense of burning arises, which speedily becomes absolute pain. This soon, however, abates; and almost wholly disappears; and if it be too violent, more butter may be added; the ichorous discharge becomes improved; the offensive odour corrected, and in from fourteen to twenty-one days, the ulcer is converted into one of a benign and readily cicatrizable character.

Rust, also, frequently administered the *extractum calendulæ* in *cancerous ulcers* and as a discutient in *chronic indurations*, in combination, however, with other efficacious agents. Schneider affirms, that he prescribed the extract with the best effects in *induration of the stomach*, and in *tumefaction* and *decided induration of the glands and uterus*. A decoction of the flowers and plant, he employed in cancer of the uterus, and found it an excellent soothing, and discutient agent. Muhrbeck† used the extract with eminent success in *chronic vomiting*; Carter§

* Hufeland und Osann's Jour. der prakt. Heilk. B. lviii. St. 1. S. 119.

† Verhandlungen der verein. ärztlich. Gesellschaft. der Schweiz. Jahrg. 1831, and Dierbach, in Heidelberger Annalen, B. x. H. 4. S. 501. Heidelberg, 1834.

‡ Hufeland's Journal der prakt. Heilk. B. lxii. St. 5. S. 128. Rust's Magazin. der gesamt. Heilk. B. xi. S. 350.

§ London Med. Rep. April, 1826, p. 347. See, also, Link and Osann, in art. Calendula in Encyc. Wörterb. u. s. w. B. vi. S. 520. Berl. 1831.

in extremely *obstinate vomiting*; and De Camp in a case of *cardialgia*, where the excitability of the stomach was so great, that every remedial agent was rejected before it had opportunity to act. Fehr also extols it as an emmenagogue, for which property it was celebrated with the older physicians; but as Riecke* has remarked, the amount of experience with calendula is yet small — too small for us to pronounce whether it merit a fixed place in the lists of the *materia medica*.

MODE OF ADMINISTERING.

The *extractum calendulæ* is contained in the Hanoverian and Saxon Pharmacopœias; in the latter it is directed to be prepared in the following manner: —

R. Calendul. officinal. part j.
Aquæ, part. viij.

Macerate for twenty-four hours; then boil for a quarter of an hour, and strain forcibly; boil the remainder with four parts of water; mix the two liquors, and, after twenty-four hours' rest, evaporate to the proper consistence.†

The dose of the extract is different according to different observers. Muhrbeck gave four grains, five times a day. Fehr allows, ʒij. to ʒvj. Phöbus directs the dose of the extract, prepared according to the Prussian Pharmacopœia, to be from eight to sixteen grains, gradually increasing it to ʒss. and more, from two to four times a day. It may be given either in the form of pill or mixture. Externally, the extract is used in solution, to moisten the dressings of ulcers, and to form ointments.

The dose of the decoction of the fresh plant is f.ʒj. to f.ʒij.

The Sardinian Pharmacopœia has a *Conserva florum calendulæ*, made by beating together one part of the flowers and two parts of powdered sugar. It has, also, an *Acetum florum calendulæ*, made of one part of the *petals* digested in four parts of *vinegar*; and the Wirtemberg Pharmacopœia has an *Unguentum florum calendulæ*, made of four ounces of the petals boiled in a pound of fresh butter, until the mixture is entirely evaporated. This is used as an emollient and resolvent.

* Op. cit. S. 101.

† Pharmacopée Universelle, &c. par Jourdan, ii. 536.

Pilulæ calendulæ.

Pills of calendula.

R. Ferri subcarb.
 Calend. pulv.
 Extract. calend. āā ʒj.
 Mucilag. acac. q. s. ut fiant pilulæ xc.

Dose. — Five to eight, three times a day, as a soothing agent
 in *cancerous ulcers*. *Rust.*

R. Hydrarg. chlorid. mit. ʒss.
 Antim. sulphur. aur. ʒj.
 Extr. calendul.
 — conii, āā ʒij. M. f. pil. pond. gr. ij.

Dose. — Five pills, three times a day, as a discutient in *chronic*
indurations. *Rust.*

Lotio extracti calendulæ.

Lotion of the extract of calendula.

R. Extract. calend.
 ——— anthemid. āā ʒij.
 Solve in
 Aq. lauroceras, f.ʒij.
 Adde
 Tinct. opii, f.ʒj.

As a dressing wash (*Verbandwasser*) in *cancerous ulcerations*. *Rust.*

It is obvious, that the precise agency of the calendula cannot be tested in any of these formulæ, the substances associated with it being themselves active agents. In this country, it is never perhaps used.

XL. CALX CHLORINATA.

SYNONYMES. Calcis Chloridum, Calcis Hypochloris, Oxychloruretum Calcii, Protochloruretum Calcii; Chloruretum Oxydi Calcii, Bichloruretum Calcis, Oxymurias Calcis, Calx Oxymuriatica, Calcaria Chlorata, Chlorum Calcariae, Chloretum Calcariae, Calcaria Chlorica, Chlorinated Lime, Chloride or Chloruret, Hypochlorite, Chlorite or Oxymuriate of Lime, Tennant's Bleaching Powder.

French. Protoxichlorure de Calcium, Oxichlorure de Chaux, Chlorure d'Oxide de Calcium, Bichlorure de Chaux, Oximuriate de Chaux, Muriate Suroxigéné ou Oxigéné de Chaux, Chlorate ou Souschlorate de Chaux, Poudre de Blanchement, Poudre de Tennant.

German. Kalkchlorid, Chlorkalk.

Chlorinated lime is a compound of chlorine and oxide of calcium.

METHOD OF PREPARING.

It may be prepared either in the dry or moist way. In the former case, *chlorine* is made to act on *hydrate of lime* in a pulverulent form; in the latter, *chlorine*, in a gaseous state, is passed into *lime water*. For technical purposes, the latter is most used; for pharmaceutical, the former. In the London Pharmacopœia, it is directed to be prepared as follows:—Take of *hydrate of lime* a pound, *chlorine*, as much as may suffice; send in the chlorine to the lime in a proper vessel, till it is saturated. Chlorine is very easily evolved from binoxide of manganese, mixed with muriatic acid, by a gentle heat.* It is generally, however, prepared in large chemical establishments, for the use of bleachers, and is therefore in the list of the *Materia Medica* in the Pharmacopœia of the United States (1842).

Chlorinated lime has the appearance of a white, loose powder, of a sour, bitterish and somewhat biting taste, exhaling a marked smell of chlorine, and dissolving with tolerable facility in water, at the same time giving off much chlorine gas.† Its nature and composition are a subject of dispute, and hence the term “chlorinated lime,” which has been adopted by the London, Edinburgh, and United States Pharmacopœias, in place of chloride of lime.

* Brande's Dictionary of Materia Medica, p. 135. Lond. 1839.

† Link, Art. Chlor, in Encycl. Wörterb. der Medicin. Wissenschaft. vii. 579. Berlin, 1831.

M. Hunonx Desfontenelles* affirms, that having prepared pills of chlorinated lime, extract of opium and honey, they experienced a spontaneous combustion a short time after they were prepared; and he states, that the reaction took place at times whilst the mixture was being made. He found, that powdered marshmallow root and liquorice, when united with chlorinated lime and honey, produced the same result. It would hence appear that chlorinated lime and organic substances ought not to be associated in the same prescription.

EFFECTS ON THE ECONOMY.

The action of chlorinated lime is generally esteemed to be analogous to that of liquid chlorine; Hufeland, however, assimilates it to that of chloride of calcium. The data have been considered as scarcely, perhaps, sufficient to determine its precise operation. It appears to us, however, to act mainly by means of its chlorine, which, being loosely combined, is readily disengaged, — all acids, even the carbonic, occasioning its separation. It is not much employed internally; but, according to Cima, it occasions slight pains in the abdomen, burning in the stomach, and at times diarrhœa.

As to its *internal administration*, Cima gave it in cases of *scrophulous swellings*. By Cloquet, it was used both internally and externally, in *gangrenous ulcers*; and by Gräfe, Deschamps, Graves,† and the author, in *factor oris*.

In a case of *pectoral disease, with great factor of the breath and expectoration*, it was administered by Drs. Graves and Stokes with remarkable benefit, — a pill of three grains with one of opium being given three times a day, and the quantity being increased to twelve grains a day: the bed was also sprinkled with a solution of it. It has been used with advantage by the author in a similar case; and in *gangrene of the lungs*.

By Reid,‡ it was administered in *dysentery*, and in a *bilious typhus* occurring in summer; by Copland§ in the last stage of *typhus fever*, when the evacuations were highly offensive, given in draughts of aromatic water with mucilage. Dr. Pereira|| also states, that he can bear testimony to the good effects of it

* Journal de Chimie Médicale, and Soubeiran, Journ. de Pharmacie, Février, 1842, p. 121.

† Dublin Hospital Reports, vol. v.

‡ Transactions of the Association of Fellows and Licentiates of the College of Physicians in Ireland, vol. v. 1838.

§ Houlton's Appendix to translation of Magendie's Formulary, p. 163.

|| Elements of Materia Medica, &c. 2d edit. p. 593, Lond. 1842; or Amer. Edit. by Dr. Carson, Philad. 1843.

in bad cases of fever ; but the same results were not observed in the *fever of Edinburgh*.* It was likewise given by Groh, Cohen, and Schlesier† in *phthisis*, and by Gräfe in *gonorrhæa*. In none of these cases is it presumable, that chlorinated lime possesses virtues not contained in liquid chlorine.

For *external use* it has been adopted in various cases, and especially in *ulcers*. According to Trusen, an aqueous solution is proper for *torpid ulcers* of almost all kinds—the *phagedenic*, the *scrophulous*, &c. In *syphilitic ulcers*, it appears to be of use when the chancre is sloughing, and eats deeply into the flesh.‡

Trusen employed a solution formed by rubbing from ℥iij. to ℥iv. with a pint of *water*, pouring off the supernatant fluid after it had stood a quarter of an hour, and applying it by means of pledgets of lint to the ulcer, renewing the application whenever the lint became dry. In this way, he found the profuse ichorous secretion from old ulcers diminish, the offensive odour abate, and fresh and healthy granulations spring up. By the same kind of treatment, *phagedenic*, *herpetic*, and *scrophulous ulcers* generally cicatrised speedily and permanently.§ Trusen employed, at the same time, crude antimony with cathartics ; and in all cases he directed strict repose, and regulated diet.

Trusen's observations have been confirmed by many modern physicians, amongst whom may be mentioned Labarraque, Lisfranc, Ekl, Lemaire, Heiberg, and Kopp. In *ozæna*, good effects were observed from it by Horner,|| Awl,¶ Heron,** Detmold,†† and Strathing : and a solution of it, in the form of injection, was found serviceable in *fistula*, by Trusen and Ricord. Even in *cancerous ulcers*, recourse has been had to it by Heiberg, Labarraque, Duparcque, Martinet, &c. : in all cases, it corrected the offensive odour, and, at times, the ulcer itself assumed a more favourable appearance.

Dr. Frohlich‡‡ used it with advantage in a *cancerous affection of the face*, in the strength of one part to sixteen parts of water.

In such cases it has been recommended, in order to have the concentrated action of the chloride, that it should be formed

* Christison, Dispensatory, p. 242. Edinb. 1842.

† Casper's Wochenschrift für die gesammte Heilkunde, No. 37, 1838.

‡ Dr. Mene, in Gazette Médicale, Feb. 11, 1832.

§ See, also, Houlton's Appendix to Magendie's Formulary, p. 162.

|| Amer. Jour. of the Medical Sciences, No. xi.

¶ Ibid. No. xxii. for Feb. 1833, p. 543.

** Ibid. Nov. 1836, p. 271.

†† Holscher's Annalen, 1840, Bd. v. Heft. 1 ; and Brit. and For. Med. Rev. Oct. 1841, p. 549.

‡‡ Medicin. Jahrbücher des k. k. österreich. Staates. B. xvii. S. 168. Wien, 1834.

into a paste by admixture with water, and be applied in this manner.

It has been used, also, in cases of *ulceration of the mouth*, by Kopp, Angelot, Heiberg, &c., applied either in the form of solution or of a soft paste.

In cases of *wounds*, the application of a solution of it has been recommended by many, as by Trusen, Ekl, Lisfranc,* to promote cicatrisation after the inflammation has subsided.

In a case of *punctured wound, received in dissecting*, and when the inflammation was proceeding up the arm with alarming rapidity, and the pain and tension were extreme, the patient experienced immediate relief from a solution used as a lotion, combined with the free use of leeches.†

Gubian‡ has proposed to apply it to prevent *pitting from small-pox*. The matured pustules are to be opened, and washed with a weak solution; desiccation takes place very promptly, and, it is said, no marks or pits are left.

On account of its antiseptic properties, it has been applied in *cancrum oris*, by Labarraque, Richter, Berndt, and numerous others, and in *sloughing affections of the female organs of generation* of an analogous nature, by Labarraque and Ekl; in *hospital gangrene*, by Percy, Labarraque, Siedmogrodzki, Delpech, and Renard; in *gangrene of the scrotum*, as well as in *ordinary gangrene*, by Heiberg and Trusen; in all of which it has been of decided efficacy.§

In such cases it may be applied either in the form of the paste above mentioned, or in strong solution — ʒij. to Oj. of water.

In *burns* of the second and third degree, when they are not spread over too great a surface of the body, a solution of chlorinated lime, according to Trusen, markedly diminishes the pain, moderates the too great suppuration, and excites, especially in the second degree, sound granulations; in the third, speedy separation of the dead portions, and in both cases a smooth and firm cicatrix. Either a solution united with mucilaginous substances, or a liniment prepared of it may be applied.

Lisfranc's observations|| entirely accord with those of Trusen. He applies compresses spread with cerate over the burnt parts; the compresses having holes in them so that the burnt surfaces are exposed; they are then covered with lint soaked in a solution of chlorinated lime, which is kept *in situ* and moistened as

* Bulletin Général de Thérapeutique, Juillet, 1838.

† Alcock, Essay on the Use of the Chlorurets, &c. Lond. 1827.

‡ Journal de Chimie Médicale, vi. 315.

§ Riecke, Die neuern Arzneimittel, u. s. w. Stuttgart, 1837.

|| Gazette Médicale, Mars 21, 1835. See also Bulletin Général de Thérapeutique, Juillet 1838; and Clinique Chirurgicale de l'Hôpital de la Pitié, Paris, 1841.

it becomes dry. A solution of it, as well as of chlorinated soda, may be applied, indeed, with advantage in the first stage of a burn or scald; and Mr. Holt* affirms, that he knows nothing so efficacious in a "black eye."

Dr. Chopin,† too, affirms, that in *wounds produced by contusion, laceration, or by the explosion of gunpowder*, where there is much pain, speedy and certain relief is produced by keeping the dressings constantly wet with a solution of it: he found it, as well as chlorinated soda, very serviceable in cases of *sore nipples*.

In *chilblains*, it has been used, both in the form of solution and of liniment with advantage; and not only in ulcerated chilblain, but where the skin was unbroken, by Trusen, Lisfranc, Gräfe, and others. In many cases, however, it has been found advantageous to diminish the inflammation first by the application of leeches. In cases of *deeper frost bites* it has likewise proved beneficial.

In *salivation* caused by mercury, it has been found valuable,‡ especially when administered at the beginning of the increase of secretion. When the pytalism has proceeded to a greater extent, Trusen uses, at the same time, sulphureous baths. A collutory of chlorinated lime not only diminishes the excessive secretion from the salivary glands, but speedily mitigates the sense of burning in the mouth; induces the healing of the erosions of the mucous membrane, and corrects the mercurial fœtor. In such cases, the author has frequently employed it and with advantage, although the affection is not much under the control of medicine.

In *offensive odours from the mouth*, arising from carious teeth, Regnard employed a solution of it, but it excited the salivary glands in a disagreeable manner. On the other hand, E. Gräfe recommends it strongly in this very case, and even in caries, both inwardly, and externally as a collutory and tooth powder. In the latter form, it is said to remove speedily the tartar and yellow depositions on the teeth. By Chevallier and Kluge, it is strongly recommended for cleansing the mouth. The latter gives a formula for a collutory, which will be found amongst the prescriptions at the end of this article. It effectually cleanses the mouth, whilst it does no injury to the enamel.

In *scarlatina*, a solution of chlorinated lime may be employed most advantageously as a gargle, and in the form of ablution to the surface.§

* Lancet, April 6th, 1833.

† Gazette Médicale, Oct. 31, 1835.

‡ Elliotson, in Mr. Houlton's Appendix to translation of Magendie's Formulary. Amer. edit. p. 162. Philad. 1834.

§ Dr. Copland, in the Appendix to Houlton's edition of Magendie's Formu-

In *scrophulous swellings of the glands*, according to Cima, it may be applied with advantage in the form of ointment; and by Gräfe it is recommended in *swellings of the joints*. It has likewise been used successfully by Werneck in *goître*.

In several *chronic eruptions*, it has been much extolled — as in *herpes*, by Kopp; in *itch*, by Heiberg, Derheims,* Cluzel, Fantonetti,† Hospital,‡ Wittzack,§ and Napoli.|| Dr. Christison¶ affirms, that he never uses any other remedy in *itch*; — a solution, containing between a fortieth and a sixtieth part of chlorinated lime, applied five or six times a day, or continuously with wet cloths, allays, he says, the itching in the course of twenty-four hours, and generally accomplishes a cure in eight days. In *pruritus pudendi muliebris*, it has been advised by Darling; and in *tinea*, by Trusen, Roche, Cottureau, Kopp, and Ebermeier. In the last disease, it is applied in the form of liniment; in the others, in solution; but in the itch often also in the form of ointment. Michaelsen recommends the following method of treating itch. Take of chlorinated lime from two to four ounces, according to the degree in which the disease exists, and the length of time it has been in the system; put this in a common flask or bottle full of rain or river water, so that as much as possible may be dissolved. In using it, the patient must shake the bottle well, in order that some of the undissolved lime may be taken up. With this, he washes the parts affected three or four times a day. Every third or fourth day, when the skin becomes somewhat rough or irritated, he is made to take a tepid bath, or to wash himself with warm soap and water; and this until the cure is accomplished. The internal management is the same as in other plans of treatment. In the case of young children, the mixture must of course be weaker, — about one ounce to a pound of water. By this plan, the patient, it is said, is entirely cured, without any unpleasant concomitants, in from seven to ten days.

Chlorinated lime has likewise been applied in *purulent ophthalmia*. Varlez** cured *contagious blennorrhæa of the eye*, by dropping upon it a solution of it. Colson, Delatte, and Reynaud,†† also saw good effects from it, both in *acute purulent ophthalmia*,

lary, p. 163. Dr. S. Jackson, of Northumberland, (now of Philadelphia,) in Amer. Journal of Med. Sciences, xii. 261 and 550, and Ibid. for May, 1838, p. 56. (Dr. J. uses chlorinated soda.)

* Journal de Chimie Médicale, ii. 575.

† Bulletin de Thérapeutique, 1833; and American Journal of the Medical Sciences, August, 1833, p. 533.

‡ Amer. Journal of the Medical Sciences, Nov. 1834, p. 240 (extracted).

§ Casper's Wochenschrift, Feb. 4, 1837, S. 79.

|| Journ. de Chimie Méd., and Amer. Jour. of Pharmacy, July, 1841, p. 172.

¶ Dispensatory, p. 242. Edinb. 1842.

** American Journal of Med. Sciences, i. 459.

†† Journal für Chirurgie, u. s. w. B. xiv. H. 4.

and in *chronic ophthalmia with granulations, obscurity of the cornea*, and especially in *copious secretion from the Meibomian glands*. Guthrie* applied a solution successfully in three cases of *ophthalmia neonatorum*; and Pereira† advises a weak solution in the same cases. Farvagnié used it beneficially in *scrophulous* and *catarrhal ophthalmia*.‡

It has likewise been employed advantageously in *other blennorrhœas* besides the one mentioned, and especially in the *gonorrhœal*.§ Gräfe, of Berlin,|| affirms, that he succeeded with it when copaiba and cubeba had failed. He used it both in the form of pill, made as described hereafter, and of injection — the injection being made by dissolving gr. xxiv. in 3vj. of *water*, and adding ʒss. of *wine of opium*.

But one of the most important of the applications of chlorinated lime is as an antiseptic and disinfecting agent.¶ It is admirably adapted for preventing and checking putrefaction, and for correcting the offensive odour of parts already putrefied:** and hence its application is most useful in anatomical investigations.†† Some time before dissection, the body may be enveloped in a cloth wetted with a solution of it (*Calc. chlorin.* ʒij., *Aquæ*, Oj.), which must be kept wet by sprinkling it from time to time: in this manner the offensive odour is speedily corrected. It is equally well adapted for purifying the air of the wards of hospitals, jails, or ships; a little of the solution being sprinkled from time to time on the floors; or shallow vessels, containing it, being placed in different parts of the room. It is used, moreover, for neutralising contagious miasmata dispersed in the air, or contained in clothing, furniture, &c., care being taken, in all these cases, that due ventilation be practised.

It has been doubted, however,‡‡ and even denied, that its use

* Medical and Physical Journal, Nov. 1827.

† Elements of Mat. Med. 2d edit. i. 593, Lond. 1842; or Amer. edit. by Dr. Carson, Philad. 1843.

‡ Verhandlung der vereing. ärztlich. Gesellschaft. der Schweiz. Jahr 1829. Zurich, 1830.

§ Alcock, Essay on the Use of Chlorurets, &c. Lond. 1827.

|| Amer. Journal of Medical Sciences, and Amer. Journal of Pharmacy, 2d series, vol. ii. 86. Philad. 1838. See, also, M. Roussf, Bulletin Général de Thérap. Janv. 1842.

¶ Labarraque, on the Use of the Chlorides of Soda and Lime, translated by Jacob Porter. New Haven, 1829.

** Alcock, Op. cit.

†† Magendie, Formulaire, &c.

‡‡ Observation on the chlorides and chlorine as "disinfecting agents," and as preventives of cholera. By H. Bronson, M.D. Boston, 1832. See, also, American Journal of the Medical Sciences, for Feb. 1833, p. 481; Dr. Albers, in London (Med. Gaz. viii. 410), as to its inefficacy in cholera; and Pereira, Elements of Mat. Med. &c., 2d edit. i. 591, Lond. 1842; or Amer. Edit. by Dr. Carson, Philad. 1843.

is productive of any advantage in preventing the spread of infectious, contagious, or epidemic diseases. Nay, it has been affirmed to be positively injurious, by deteriorating the atmosphere, and in this there may be truth, unless the precautions, mentioned above, be taken. In various cases, in which such diseases have prevailed, it has destroyed all offensive odour, but the extension of the malady has not been prevented.*

MODE OF ADMINISTERING.

Chlorinated lime has been given internally both in the form of *solution* and of *troches*, the dose being from gr. j. to grs. vj. four to six times a day. Externally, it is generally applied in solution of different strengths, (from ℥j. to ℥iv. to eight ounces of water) — being decanted to remove the particles of lime from it, unless where it is considered advisable to employ the turbid solution.

In cases of very offensive evacuations from the bowels, ten or fifteen grains may be added to a common enema. It is, likewise, applied in the form of ointment, and of liniment, and, also, of a paste made by admixture with water.

The following forms have been given for its administration :†

Trochisci calcis chlorinatæ.

Lozenges of chlorinated lime.

- R. Calcis chlorin. ℥ij.
 Sacchar. ℥viiij.
 Amyl. ℥j.
 Tragac. ℥j.
 Carmin. gr. iij.
 M. Fiant trochisci. pond. gr. iij.

One of these to be taken three or four times a day, and allowed to dissolve in the mouth, in cases of *fætor oris*.

Deschamps.

* Pereira, Ibid. p. 592.

† Riecke, Op. cit. S. 94.

Mistura calcis chlorinatæ.

Mixture of chlorinated lime.

- R. Calcis chlorin. ℥j.
 Mist. amygd. f. ℥vij.
 Syrup. acaciæ, f. ℥j. M.

A table-spoonful every three hours in *gonorrhœa*.

*E. Gräfe.**

Pilulæ calcis chlorinatæ.

Pills of chlorinated lime.

- R. Calcis chlorin. ℥j.
 Ext. opii, gr. ix.
 Mucilag. acac. q. s.
 Divide in pilulas liv.

Dose. — One, every two or three hours, in gonorrhœa, gradually increasing the dose until eight, ten, or twelve are taken every hour.

Gräfe.

Collutorium calcis chlorinatæ.

Collutory of chlorinated lime.

- R. Calcis chlorin. grs. xv. ad ℥ss.
 Mucil. acac. f. ℥j.
 Syrup. aurant. f. ℥ss. M.

A little of this solution to be applied by means of a mop of charpie to *ulcers in the mouth*.

Angelot.

- R. Calcis chlorin. ℥ijj.
 Aquæ destillat.
 Alcohol, aa. f. ℥ij.
 Ol. rosæ, gtt. iv.
 Solve et filtra.

Chevallier.

A tea-spoonful of this solution is mixed with a glass of water,

* Journal für Chirurgie, u. s. w. B. xiv. St. 2.

and used in *fætor oris*. According to Riecke,* an analogous nostrum has been sold at a high price under the name — *Pneumokatharterion*.

R. Calcis chlorin. ℥j.
Solve, leniter terendo, in
Aquæ destillat. f. Ovj.
Tunc adde
Alcohol. (.830) f. ℥viij.

Mist. reponatur in loco frigido per horas xxiv.; tunc filtretur et reserv. in lagenâ bene obturatâ. ("Let the mixture be put aside in a cold place for twenty-four hours; then let it be filtered and kept in a well stopped vessel.")

It has been recommended that the mouth should be rinsed with this after the teeth have been brushed.

Freyberg von Kluge.

R. Calcis chlorin. ℥ss.
Solve exactiss. trituratione in
Aq. f. ℥ij.
Et post limpid. clarificat. admisce
Alcoholis, f. ℥ij.
Ol. rosæ, gtt. iv. M.

The mouth is rinsed in cases of *salivation* with a mixture made by adding a tea-spoonful of the solution to a glass of water.

Trusen.

The Pharmacopœia of Sweden has an *antiscorbutic collutory*, called *Linctus ad stomacacen seu oxymuriatis calcici*, which is formed as follows:

R. Solut. calcis chlorin. ℥ss.
Aquæ,
Mellis, ââ. ℥vj. M.

Dentifricium calcis chlorinataæ.

Dentifrice of chlorinated lime.

R. Calcis chlorin. in pulv. gr. iv.
Corallinæ rubræ, ℥ij. M.

A new tooth-brush should be slightly wetted, dipped in this

* Op. cit. S. 94.

powder, and rubbed over the teeth. Employed to give their natural colour to teeth.

Magendie.

Solutio calcis chlorinatæ.

Solution of chlorinated lime.

R. Calcis chlorin. ℥iij.
Solve in
Aquæ destill. Oj.
Adde
Tinct. opii crocat.
vel Vini opii. f.℥j. ad f.℥ij. M.

Applied to *frost-bites*.

Trusen.

R. Calcis chlorin. ℥ss.
Tere invicem et sensim affunde
Aq. (seu Aq. rosæ) Oj.
Et post clarificat. limpid. admisce
Mucil. acac. (seu sem. cydon.) ℥ij.

Applied by means of linen rags in cases of *burns*.

Trusen.

R. Calcis chlorin. ℥ij. ad ℥iij.
Aquæ, Oj. Solve.

To be applied by means of rags kept constantly wet in cases of *hospital gangrene*; the mixture being shaken.

Rust, and Kluge.

R. Calcis chlorin. ℥iij.
Aquæ destillat. Oj.
Solve et cola.

Used as a lotion in cases of *itch* on the thighs, legs, and arms, twice or thrice daily. In general, six or eight days are sufficient to effect a cure.

Magendie.

The *disinfecting liquor of Labarraque*, *Liqueur désinfectante de Labarraque*, is made by adding ten parts of *water*, to one part of the *chlorinated lime* divided in a mortar; suffering the solution to settle, and then filtering.

Collyrium calcis chlorinatæ.

Collyrium of chlorinated lime.

- R. Calcis chlorin. gr. iv. ad vj.
 Vin. opii, ℥x.
 Mucilag. acac. f. ʒiss.
 Aq. rosæ, f. ʒij. M. et filtra.

To be dropped in the eye in cases of *catarrhal* and *scrophulous ophthalmia*. *Farvagnié.*

Injectio calcis chlorinatæ composita.

Compound injection of chlorinated lime.

- R. Calcis chlorinat. ʒij.
 Decoct. kramer. f. ʒxij. M.

Half an ounce of this to be injected into the nose three or four times a day in cases of *ozæna*.

Detmold (of Hanover).

Cataplasma calcis chlorinatæ.

Cataplasm of chlorinated lime.

- R. Calcis chlorin.
 Sodii chlorid. āā. ʒss.
 Aquæ destill. Oss.
 Farinæ sem. lin. q. s. ut fiat cataplasma.

Used in cases of *scrophulous swelling of the joints*.

Grüfe.

Unguentum calcis chlorinatæ.

Ointment of chlorinated lime.

- R. Calcis chlorin. ʒj.
 Adipis, ʒj. M. fiat unguentum.

To be rubbed in, in cases of *scrophulous swellings*.

Cima.

- R. Calcis chlorin. ʒss.
 Adipis, ʒj. M. f. unguent.

Used in *goître*.

Werneck.

R. Adipis, ℥j.
 Sodæ borat.
 Calcis chlorin. āā. ℥j. M. exactissimè.

In cases of *chilblains*:

Trusen.

R. Sulphuris, ℥iss.
 Calcis chlorin. bene. tritur. ℥ij.
 Adipis, ℥x. M.

In *itch*, morning and evening.

Hospital.

Linimentum calcis chlorinatæ.

Liniment of chlorinated lime.

R. Calcis chlorin. ℥ss.
 Tere in mortario vitreo et sensim affunde
 Aq. rosæ, (seu fontanæ,) f.℥j.
 Et post. limpid. clarificat. admisce
 Ol. amygd. f.℥j.

To be applied by means of a pencil in cases of *tinea capitis*.
Trusen.

XLI. CANNABIS INDICA.

SYNONYMES. Indian Hemp, Gunjah.

Dr. Pereira* states, that the Cannabis, which grows in India and has been described by some botanists under the name *Cannabis Indica*, does not appear to him to possess any specific differences from the common hemp, *Cannabis sativa*; and accordingly, by many botanists, they have been regarded as identical.

The narcotic effects have been long known to the people of Southern Africa, South America, Turkey, Egypt, Asia Minor, India, and the adjacent countries of the Malays, Burmese, and Siamese, by whom it is used in various forms to induce intoxication. It is, likewise, extensively employed in popular practice in various diseases. In Western Europe its use is unknown, and it is questionable, whether the hemp of that region or of

* Elements of Materia Medica, 2d edit. p. 1096. Lond. 1842.

this country be possessed of the same properties. Dr. O'Shaughnessy states, that the extraordinary symptoms produced by the oriental plant depend upon a resinous secretion with which it abounds, and which seems to be wholly absent in the European plant. The absence of the resinous secretion, and consequent want of narcotic power, he ascribes to difference of climate.

Within the last few years, Dr. O'Shaughnessy, of Calcutta,* has detailed many interesting facts in regard to the therapeutic agency of this plant, which, "we doubt not"—says a recent writer†—"will cause a great sensation among the members of the profession throughout the world."

In certain seasons, and in warm countries, a resinous juice exudes, and concretes on the leaves, slender stems and flowers of the Cannabis. This constitutes the *churrus* of Nipal and Hindusthan, and in it reside the powers of all the preparations of hemp. This resin—*cannabin*—is very soluble in alcohol and ether; partially soluble in alkaline, but insoluble in acid, solutions. When pure, it is of a blackish-grey colour; it is hard at 90° of Fahrenheit, but softens at higher temperatures, and fuses readily. It is soluble in the fixed, and in several volatile oils. Its odour is fragrant and narcotic; taste slightly warm, bitterish and acrid. The dried hemp plant, which has flowered, and from which the resin has not been removed, is called *Gunjah*. It yields to alcohol twenty *per cent.* of resinous extract, composed of the resin—*churrus*—and green colouring matter. The *Gunjah* is used for smoking. The larger leaves and capsules, without the stalks, constitute *Sidhee*, *Subjee*, or *Bang*, which is used to form with water an intoxicating drink. When the plant is distilled with a large quantity of water, traces of volatile oil pass over, and the distilled liquor has the powerful narcotic odour of the plant.

EFFECTS ON THE ECONOMY IN HEALTH.

The effects of this remedy would appear to have been well known to the Arabian and Persian physicians of both modern and ancient periods; but the first person, who seems to have well tested its properties is Dr. O'Shaughnessy. In his various experiments, he did not observe the least indication of pain, or any degree of convulsive movement. They all, he affirms, "led to one remarkable result,—that while carnivorous animals and fish, dogs, cats, swine, vultures, crows, and adjutants invariably and speedily exhibited the intoxicating influence of the drug, the

*On the Preparations of Indian Hemp, or *Gunjah* (*Cannabis Indica*), &c., Calcutta, 1839; and Brit. and For. Med. Rev. July, 1840, p. 224.

† Brit. and For. Med. Rev. loc. cit.

graminivorous,—such as the horse, deer, monkey, goat, sheep, and cow,—experienced but trivial effects from any dose that was administered.” Encouraged by these results, Dr. O’Shaughnessy felt no hesitation as to the perfect safety of giving the resin of hemp an extensive trial in cases in which its apparent powers promised the greatest degree of utility.

The general effects observed on man were alleviation of pain in most cases, remarkable augmentation of the appetite, aphrodisia, and great mental cheerfulness. The more violent effects were a peculiar form of delirium, and a cataleptic state.

Dr. Pereira* experimented on some specimens of Gunjah and Nipalese churrus, which were sent to him by Dr. O’Shaughnessy. He tried them both on animals and man, and gave specimens of them to medical friends; but their effects were found to be comparatively slight. “Whether,”—says Dr. Pereira,—“this be owing to the preparations having undergone some deterioration in their passage, or to the comparative phlegmatic temperament of the English, I know not. My experiments on animals were made in the Lecture-room of the London Hospital before the students of the Materia Medica class; and the trials on the human subject were made in the wards of the hospital.”

EFFECTS ON THE ECONOMY IN DISEASE.

Indian hemp was prescribed by Dr. O’Shaughnessy in various diseases. In *rheumatism*, acute and chronic, the results were not very satisfactory. In one case, the most marked catalepsy supervened along with the usual intoxicating effects. In a case of *hydrophobia*, the soothing influence of the remedy was very great; but the disease terminated fatally. In *cholera*, he considered its agency to be “promising, and to deserve the attention of the practitioner.” The testimony is strongest in regard to its influence in *traumatic tetanus*; of which Dr. O’Shaughnessy refers to fourteen cases: of these, *nine* appear to have recovered. From the results of these cases, he concludes, that the resin of hemp, given boldly and in large doses, is capable of arresting effectually the progress of that formidable disease, “and in a large proportion of cases, of effecting a perfect cure;”—and further; “that in hemp the profession has gained an anticonvulsive remedy of the greatest value.”

With such strong evidence in its favour, it is certainly important, that Indian hemp should be subjected to a full and fair trial; and even admitting that it may fall short of the character given of it by Dr. O’Shaughnessy, it can scarcely fail to be an important addition to our Materia Medica.

* Elements of Mat. Med. 2d edit. ii. 1098. Lond. 1842.

MODE OF ADMINISTERING.

The preparations used by Dr. O'Shaughnessy are the following:—

Extractum cannabis Indicæ alcoholicum.

Resinous or alcoholic extract of Indian hemp.

This is prepared by boiling the rich adhesive tops of the dried *Gunjah* in alcohol (.835) until all the resin is dissolved. The tincture, thus obtained, is evaporated to dryness in a vessel placed over a pot of boiling water.

In *hydrophobia*, the resin in soft pill, to the amount of ten to twenty grains, is directed to be chewed by the patient, and to be repeated according to the effect.

Tinctura cannabis Indicæ.

Tincture of Indian hemp.

R. Extract. cannab. indic. alcohol. gr. xxiv.
Alcohol. dilut. f. ʒj.

Of this a dram is given in *tetanus* every half hour, until the paroxysms cease, or catalepsy is induced. In *cholera*, ten drops given every half hour were often found to check the vomiting and purging, and bring back warmth to the surface. Dr. O'Shaughnessy's experience leads him to prefer small doses of the remedy in order to excite rather than narcotize the patient.

XLII. CARBO ANIMALIS.

SYNONYMES. Carbo Carnis, Animal Charcoal.

French. Charbon animal.

German. Thierische Kohle; Fleischkohle, Thierkohle.

Animal charcoal is an ancient remedy, which has been revived amongst us. The older physicians used several kinds, and recommended them in various diseases, but without having any fixed principle; the circumstances, indeed, that suggested their

exhibition in many cases, are entirely unintelligible to us of the present day. In the old Wirtemberg Pharmacopœia, we find the *Erinaceus combustus*, or "burnt hedgehog," as an antihydroptic; the *Sericum tostum*, or "burnt silk," and the *Hirundines combustæ*, or "burnt swallows," as antiepileptics; the *Lepus combustus*, or "burnt hare," as an antilithic; the *Reguli usti*, or "burnt wrens," advised in nephritis and in calculous affections; and the *Talpæ combustæ*, or "burnt moles," at one time much extolled in erratic gout, lepra, scrophula, ulcers and fistulæ! All have properly fallen, however, into oblivion with the profession, although there may yet be some, who cling with pertinacity to these relics of ancient ignorance and superstition. The "cancer remedy" of Cosme, into the composition of which burnt shoe-soles entered, appears to have kept up the employment of animal charcoal; as well as the "burnt sponge," *Spongia usta*, in which, however, the charcoal is of but little efficacy compared with the iodine it contains. These were perhaps the only forms in which animal charcoal was used at the time when Weise, a German physician, revived its employment; and many physicians soon came forward to attest favourably in regard to it.

METHOD OF PREPARING.

Weise gives the following method of preparing it:—Cut *ribs of veal*, with the flesh attached, into small pieces, and put them into a drum for roasting coffee, — turning the drum constantly whilst it is placed over the fire. When inflammable air begins to pass off, which is distinguished by the flame playing around the drum, the combustion must still be kept up a quarter of an hour longer. If it be continued so long as any inflammable air is disengaged, the preparation is inefficacious. The substance, most commonly met with under the name of "animal charcoal," is obtained by burning bones. The residue, when reduced to powder, is the well known substance *bone black*, or *ivory black*. This generally contains more or less phosphate of lime according to the kind of bone from which it has been procured. It is directed in the London Pharmacopœia and in the last edition of the Pharmacopœia of the United States (1842), to be purified by digestion in dilute muriatic acid, as follows: Take of *animal charcoal*, a pound; *muriatic acid* and *water*, each twelve fluid ounces. Mix the muriatic acid with the water, and gradually pour it upon the charcoal; then digest for two days in a gentle heat, occasionally agitating. Set aside, and pour off the supernatant liquor, then wash the charcoal with repeated portions of water, till no traces of acid are perceptible; lastly, dry it. Charcoal, prepared in this way, should be a combination of car-

bon, carbonate and phosphate of lime, hydrogen, and azote. From an analysis, which Meurer made of animal charcoal, prepared according to Weise's formula, it contains, also, chloride of sodium and a little carbonate of soda, as well as a portion of iron.

EFFECTS ON THE ECONOMY.

In the case of a young man of *scrophulous diathesis*, Weise saw a *tumour*, of the size of a hazelnut, and very painful, situate under the nipple, disappear under the use of animal charcoal. According to him, its efficacy is strongly exerted on the uterus and *mammaræ*. Rothamel and Hohnbaum extol it in *dyspepsia* and *gastricism*, as well as in cases of *diarrhœa*. In obstinate *chronic glandular indurations*, especially of the mammary glands, Weise affirms it to be a certain remedy : he, at the same time, however, considers a regulated diet to be indispensable. *Scirrhus of the lips*, he says, also disappears under its use, and even *scirrhus goître* when the charcoal is associated with burnt sponge. On *cartilaginous polypi*, it is said to have exerted a beneficial agency, and to have diminished the tendency of *mucous polypi* to return after operation. Even *open cancer*, it is asserted, has been healed by it.* On these recommendations of Weise, animal charcoal has been used by several German physicians, especially by Wagner, Kopp, Pitschaft, Radius, Rothamel, Hesselbach, Gumpert, Hohnbaum, Fricke, Michaelsen, and Siebenhaar ; and, as a general result of their observations, it would seem not to be devoid of therapeutical agency ; although many of the experimenters failed in noticing any sanative effect from it. Fricke, for example, did not observe the least benefit in the very cases mentioned by Weise. He gave it, also, in the way of experiment, in several other cases, but without detecting the slightest influence on the organism. Other physicians saw advantages from its use in open cancer, but these were only transient. On the other hand, the experience of Wagner, Kopp, Michaelsen, and Rothamel would seem to show, that it was effectual in removing *incipient scirrhus of the mammaræ*. Kopp employed it successfully in *scirrhus goître*, and Pitschaft in a case of what he terms *struma varicosa*. Radius dispersed under its use a considerable *swelling of the submaxillary glands*. In *scrophulous affections*, especially in *scrophulous indurations of the glands*, it is said to have proved useful in the hands of Kopp, Rothamel, Speranza, Kuhn, and others, but Baudelocque did not find it to possess any therapeutical property.† Pitschaft, in a

* Riecke, Die neuern Arzneimittel, u. s. w. S. 104.

† Dubois (d'Amiens), Traité de Pathologie Générale, 2ème édit. p. 206. Bruxelles, 1835.

delicate, strumous woman, who was suffering constantly under *ozæna*, found it of eminent service after other remedies had failed. Radius thought it aided the absorption of a *disintegrated cataract*, and Siebenhaar saw good effects from it in *induration of the pancreas*.

Riecke* suggests, that farther trials may show, that it might be used in the place of iodine, which it appears to resemble in its action on the economy, whilst it affects the organism less injuriously. It is extremely doubtful, however, whether the properties of the two substances can be regarded as at all analogous, and whether animal charcoal be possessed of any other properties than those usually ascribed to prepared charcoal.

MODE OF ADMINISTERING.

Carbo animalis is given in doses of from half a grain to three grains twice a day, — commonly in the form of powder with sugar, or with powdered liquorice root. Weise advises it to be sprinkled on the hard edges of *cancerous ulcers*, and Speranza extols an ointment made of charcoal, and oil, or simple cerate as a discutient in *scrophulous swellings*.

Pulvis carbonis animalis.

Powder of animal charcoal.

R. Carbon. animal. gr. ij.

Glycyrr. pulv. gr. v.

F. pulvis.

A powder to be given morning and evening.

R. Carbon. animal. gr. vi.

Spong. ust. gr. xij.

Glycyrrhiz. pulv. ℥ss.

M. f. pulv. in partes vi. æquales dividendus.

A powder to be taken night and morning in *scirrhus goître*.
Riecke.

R. Carbonis animal. gr. iv.

Glycyrrh. pulv. ℥iv. M. et divide in part. viij.

One of these to be taken dry, morning and evening, a little

* Op. cit.

water being drunk afterwards, in cases of *scirrhus indurations of the mammae*. After the eight powders have been taken, the dose may be increased gradually by half a grain, until it ultimately attains four grains. At the same time, unirritating and spare diet should be inculcated.

Boli carbonis animalis.

Boluses of animal charcoal.

- R. Carbon. animal. gr. iij.
 Ammon. muriat. pulv. ℥j.
 Ext. conii, gr. ij.
 — glycyrrhiz. q. s. ut fiat bolus.

One of these to be given three times a day; — in cases of *swelling and scirrhus of the prostate*, and of the *mucous membrane of the urethra*.
Magendie.

XLIII. CARBO'NIS SESQUI-IO'DIDUM.

SYNONYMES. Carbonis Sesqui-ioduretum, Sesqui-iodide or Sesqui-ioduret of Carbon.

This preparation is made by mixing *concentrated alcoholic solutions of iodine* and *potassa* until the former loses its colour. A solution is obtained, from which the addition of water throws down a yellow precipitate — the sesqui-iodide of carbon.

This substance is soluble in alcohol and ether, but insoluble in water. The ethereal solution yields large yellow crystals by slow evaporation. It has a sweet taste, and a strong saffron-like odour. Mitscherlich* considers the taste very disagreeable.

Fifty grains given by Dr. Cogswell,† to a strongly made terrier dog, proved fatal; and, on dissection, the large vessels were found congested; the inner membrane was closely corrugated, and the apices of the rugæ were of a rose-red colour.

* *Traité de Chimie*, traduit par Valerius.

† *Essay on Iodine*, p. 122. Edinb. 1837.

EFFECTS ON THE ECONOMY IN DISEASE.

Dr. Litchfield* used it with advantage in five cases of *enlarged glands*; in two of *lepra*, and three of *porrigo*, in the form of ointment composed of ℥ss. of the powder to ℥vj. of simple cerate.

XLIV. CETRARINA.

SYNONYMES. Cetrarin, Cetrarine.

French. Cetrarin.

This substance has been extracted, of late, from *Cetraria Islandica*, by M. Herberger, a pharmacien at Kaiserslautern.†

METHOD OF PREPARING.

The coarse powder of *cetraria* is boiled for half an hour in four times its weight of *alcohol* at .883; it is then left at rest until vapours cease to be given off, to avoid the loss of the alcohol; when it is strained and pressed. Three drams of *muratic acid*, previously diluted with *water*, are now added to each pound of the moss; this is mixed with from four times and a quarter to four times and a half its bulk of *water*, and the mixture is left at rest for a night in a closed flask. The next day, the deep yellow fluid, which swims above the copious deposit obtained, is poured off: this deposit is the impure cetrarin, the colour of which is more or less greenish. It is now collected on a filter (*chausse*), left to drain as little as possible and subjected to pressure. To purify it, it must be divided into small fragments, and washed whilst still moist with alcohol or ether, which deprives it of colour; it is then treated with two hundred times its weight of *boiling alcohol*, in which the inorganic matter, that has hitherto accompanied it, is scarcely soluble. The greater part of the cetrarin is gradually precipitated on the cooling of the alcoholic solution. The portion, which still remains in solution, may be separated by the evaporation of the alcohol.

Pure cetrarin is, at times, in the state of a white powder, re-

* Lond. Med. Gaz., Aug. 1836.

† Buchner's Repertorium, B. viii. H. 1. 1837.

sembling magnesia ; at others, in small globules united in the form of arborisations, which do not present — even under the microscope — any crystalline texture. When gently compressed, it has a slight silky splendour. It is neuter, light, unalterable in the air, inodorous, and has a very intense bitter taste, especially in the alcoholic solution. Its best solvent is absolute alcohol, one hundred parts dissolving 1.70 of it at the boiling temperature, but only 0.28 at 14° centig. (58° Fahr.). Alcohol, at 0.830 dissolves 0.44 when boiling, 0.28 at 25° cent. (77° Fahr.), and only 0.04 at 14° cent. (58° Fahr.). It is still less soluble in boiling and in cold water, the essential oils, creasote, &c. It is somewhat more soluble in ether, but insoluble in the fixed oils.*

EFFECTS ON THE ECONOMY IN DISEASE.

Müller, a physician of Kaiserslautern,† details two cases in which he has administered cetrarin. One of these was a *quartan*, the other a *tertian intermittent*. The effects appeared to be exerted more slowly than those of quinia, but it seemed to him not to affect the stomach so much.[?] Its price must be considerably less, as M. Herberger succeeded in obtaining from a pound of lichen 135 grains of very pure cetrarin.

It has not been given, so far as we know, in this country.

METHOD OF ADMINISTERING.

Müller gave it in the form of powder, according to the following prescription: —

R. Cetrarin.
Acaciæ, ãã. gr. ij.
Sacchar. ʒss. M. et fiat pulvis.

Dose. — One of these every two hours, during the *apyrexia*.

Bruck,‡ suggests, that if dissolved in alcohol, its action may be incomparably more potent, and that it may more speedily arrest the paroxysms of an *intermittent* than when given in powder.

* Journal de Pharmacie, xxiii. 505. Paris, 1837, and Bulletin Général de Thérapeutique, No. 18, Sep. 30, 1837.

† H. Bruck, in Bulletin Général de Thérapeutique, No. 17, Sep. 15, 1837.

‡ Op. cit.

XLV. CHIMAPH'ILA (FO'LIA).

SYNONYMES. *Chimaphilæ* vel *Chimophilæ* *Umbellatæ* *Folia*; *Pyrola*, *Pyrolæ* *Umbellatæ* *Folia*, Winter Green, Umbellated Winter Green, Pipsissewa.

French. Herbe à pisser, Pyrole en Ombelle.

German. Die Blätter des holdenblühtigen Wintergrüns.

This plant is not new to us; but numerous trials have been made with it recently in Europe. It is admitted into the Pharmacopœia of the United States, is a beautiful evergreen, and is indigenous in the northern parts of Europe, Asia, and America. It belongs to the NATURAL FAMILY of heaths, *Ericææ*, *Pyrolaceæ* (Lindley); and SEXUAL SYSTEM, *Decandria Monogynia*. A good description of it is given by Barton.*

The leaves have a bitter sweetish taste, with some degree of astringency. The taste of the stems and roots is, in addition, considerably pungent. Boiling water and alcohol extract the virtues of the plant. The constituents, so far as ascertained, are bitter extractive, tannic acid, resin, gum, lignin, and saline matters.

The active principle has not been determined. It probably resides in the bitter extractive;—the resin and tannic acid, however, contributing to its effects.†

EFFECTS ON THE ECONOMY IN DISEASE.

The leaves of *Chimaphila* were long used by the Indians of this continent, and from them the American physician was induced to employ them. The first regular treatise respecting the plant is said to have been a thesis of Dr. Mitchell, published in the year 1803.‡ In Canada, it is said to have been long used in *diseases of the urinary passages*, especially in *calculus*, *dropsy*, and in *chronic gout* and *rheumatism*; its effects appearing to resemble — but not to exceed — those marvellously ascribed to *uva ursi*.§ Somerville|| and Barton extol it as an excellent diuretic in different forms of *dysuria*, and in *dropsies*, especially such as succeed to acute diseases; in *nephralgia* as a palliative,

* Medical Botany, i. 17; see, also, Art. *Chimaphila*, in Wood and Bache's Dispensatory, 4th edit. p. 197. Phila. 1839.

† Pereira's Elements of Materia Medica, &c., ii. 1333. Lond. 1842; or Amer. edit. by Dr. Carson, Philad. 1843.

‡ Barton's Collection, ii. 2.

§ See the author's General Therap. and Mat. Med. i. 275. Philad. 1843.

|| Medico-chirurgical Transactions, v. 340.

especially when the paroxysms are occasioned by gravel which has accumulated in the kidney; and even in *vesical calculus*. During its use, the appetite improved, and the digestive powers augmented; the patients often experiencing — immediately after it was taken — an agreeable sensation in the stomach, and in the region of the kidneys.

Radius* found it especially serviceable in *dropsy, gout, and rheumatism*; and in *inordinate activity of the secretory function of the mucous membranes — chronic catarrh, phthisis pituitosa, &c.* According to him, it is contraindicated where there is much fever, disposition to diarrhœa, gastricism, and great debility of the stomach. Heyfelder affirms, that it appears to be advantageous in the *debility of the digestive organs attendant upon dropsy*, but its diuretic effect is not considerable, or enduring, so that it requires to be associated with other more powerful agents.

Experiments, which have been made recently in the Bürger-hospital at Pesth, and which have been collected by St. Rochus and published by Windisch, the director of the hospital, are extremely favourable to the chimaphila. Within two years, nearly two hundred *dropsical cases* are said to have been radically cured by it. Windisch recommends it most strongly to the attention of his colleagues; he asserts it to be one of the best diuretics we possess; that it does not impair digestion; moderately accelerates the circulation; gently encourages the action of the bowels, and powerfully augments the urinary secretion; that the patients willingly take it, and that it induces no nausea. It was administered with advantage in dropsies unaccompanied by fever, and not dependent upon organic mischief, upon “corruption of the humours or paralysis of the lymphatic textures.” In febrile conditions and inflammatory diatheses, it is said to have been always injurious, as well as when it was administered prior to the resolution of obstructions remaining after long protracted intermittents; but when these are removed, and no excitement exists, — more, according to Windisch, is to be expected from it than from any other agent, and he strongly advises, that careful trials should be made with it in the proper cases. He advises, also, that its use should be persevered in, in order that good effects may be derived from it.

The author has frequently administered chimaphila in public and private practice, and has found it serviceable, where a tonico-diuretic was indicated. It is probably owing to its tonic properties, that it has been found occasionally serviceable in *scrophula*.

* Auserlesene Heilformeln zum Gebrauche für praktische Aerzte und Wundärzte, u. s. w. Leipz. 1836.

MODE OF ADMINISTERING.

Chimaphila is given either in *infusion*, or, what is preferable, in *decoction*; the dose in the day being from half an ounce to an ounce. Where it does not act sufficiently on the bowels, Radius advises, that a few senna leaves should be added. In affections of the chest, he found the addition of the spirit of nitric ether advantageous. Generally, however, he gave it alone. Windisch found a combination of it with tartrate of antimony and potassa, sulphuret of potassium, muriate of ammonia, squill, and, in very great weakness, cinchona and preparations of iron, serviceable. Radius often administered also the aqueous or spirituous extract.

Decoctum chimaphilæ.

Decoction of chimaphila.

R. Chimaphil. ℥j.
Aquæ, Oij. (Oiss. Ph. U. S. and Lond.)
Coque ad colatur. Oj.

To be used daily in *dropsy*.

Somerville.

Dr. Joy* adds to this two drams of *Liquor Potassæ Carbonatis*, and directs four table-spoonfuls of the mixture to be taken three times a day. He recommends it "in *dropsy* and *chronic affections of the urinary organs*," as if all these affections were identical or even analogous pathological conditions!

R. Chimaphil. ℥ss. ad ℥j.
Coque cum aquæ f.℥xij. ad reman. f.℥vj.
Coctione finitâ adde
Spiritus frumenti. (*gin, malt spirit or whisky*) f.℥ij.
Digere frigide per horas vj. et cola.

Dose. — Two spoonfuls to be taken four times a day in *dropsy* and *gout*.

Radius.

* Tweedie's Library of Medicine, v. 312. London, 1840; and 2d American edit. vol. iii., p. 692. Philad. 1842.

R. Chimaphil. ℥vj.
 Coque cum aq. f.℥xij. ad reman. f.℥vj.
 Sub finem coctionis adde
 Fol. sennæ ℥ij. et cola.

Dose. — A spoonful to be taken every two hours.

Radius.

XLVI. CHLO'RINUM.

SYNONYMES. Chlorinium, Chlorineum, Chlorum, Chlorine, Murigene, Acidum Muriaticum Oxygenatum, Acidum Marinum Dephlogisticatum, Spiritus Salis Marini Dephlogisticatus, Dephlogisticated Muriatic Acid, Oxygenated Muriatic Acid.

French. Chlore.

German. Chlor, Chlorgas.

Uncombined chlorine is employed medicinally not only in the gaseous but in the liquid state. Of each of these we shall treat in succession.

The forms for evolving it in the gaseous state, as well as the gaseous chlorine itself, have had various names assigned them expressive of their chemical or medical properties. They have been termed, respectively, *Acidum muriaticum oxygenatum ad contagia*; *Fumigatio muriatico-oxygenata*; *Pulvis ad fumigationes muriaticus*; *Species pro vaporibus superoxydi muriatici*; *Suffitus oxymuriaticus*; *S. chlorini*; *Alexiterium Chlo-ricum*, *Fumigation de Chlor*, *F. de Guyton*, *F. Guytonienne*, *F. Hygiénique*, &c.

MODE OF PREPARING.

Chlorine is obtained from chlorohydric or muriatic acid. For this purpose, one part of well pulverised *peroxide of manganese* with five or six parts of *concentrated muriatic acid* is put into a retort, to which heat is applied and the gas received over water. Or, it may be obtained from a mixture of one part of *peroxide of manganese*, four parts of *kitchen salt*, two parts of *concentrated sulphuric acid*, and four parts of *water*.

Chlorine is a greenish-yellow gas; of a peculiar, strong, disagreeable, stifling odour. The flame of a lighted taper introduced into it becomes at first pale, afterwards red, and is ultimately extinguished. It remains unchanged in the highest temperatures. It has a great affinity for hydrogen, so that it abstracts

this gas from every substance that contains it, and forms with it chlorohydric acid. Hence it decomposes all the gases that contain hydrogen, and all organic colouring matters, as well as — it is conceived by many — miasmata and contagious matters.

EFFECTS ON THE ECONOMY.

Chlorine, when diluted, and received into the lungs, occasions coughing, and symptoms of suffocation, to which a protracted catarrh often succeeds: not unfrequently, too, we observe in those, who are compelled to be exposed to the gas, bronchitis, and pneumonia. Animals soon die when they are immersed in it.*

In Mr. Broughton's experiments, mice exposed to it fell dead in less than thirty seconds. On opening them, the heart was found palpitating; the peristaltic motion of the intestinal canal continued, and could be kept up by irritating it with a probe. The vessels of the brain were collapsed. The lungs were tinged with the yellow colour of the gas, and the peculiar odour of chlorine was perceptible throughout their structure. Coagulation of the blood took place as under ordinary circumstances. A rabbit, two or three weeks old, was immersed in chlorine, and died in less than half a minute. On opening the thorax, the heart was found acting freely, and on puncturing the aorta, the blood jetted out forcibly to a considerable distance. The peristaltic motion of the bowels was also going on. The vessels of the brain were in a collapsed state. The lungs were very much distended, tinged yellow, and, when removed from the chest to a distance, emitted the odour of chlorine. The right ventricle of the heart was distended with dark blood. The eyes were much glazed in each experiment. "It has been generally thought," adds Mr. Broughton, "that chlorine is incapable of passing the epiglottis" [the glottis], "but from the above observations it is evident that this gas enters the bronchial tubes in the act of inspiration. A portion of it probably circulates through the brain, suspending the cerebral functions without directly destroying the action of the involuntary organs, — contractility remaining long after the destruction of animal life, as is evinced by the activity of the heart and of the intestinal canal."†

These very facts, however, seem to show, that but little of the gas enters the lungs; probably no more than what passes immediately preceding the closure of the glottis by the forcible contraction of the arytenoidei muscles. When inhaled in a dilute state, it is absorbed; and, according to Mr. Wallace, the urine

* See Christison on Poisons, 3d edit. p. 736. Edinb. 1836.

† Journal of the Royal Institution, from Jan. to June, 1830.

acquires bleaching properties. It would appear, also, that, in manufactories, the chief consequences from exposure to an atmosphere of chlorine are acidity, and other stomach complaints, which the men generally remove by taking chalk :* this fact is confirmatory of the view, that acidity of the stomach is usually, if not always, dependent upon excess in the secretion of the gastric acids, the most important of which is the chlorohydric. When chlorine is inhaled, it is reasonable to suppose that more of this acid may be secreted in the stomach.

METHOD OF EMPLOYING.

1. *By Inhalation.* — In the way of inhalation, chlorine gas is never administered in a state of purity, but always diluted with atmospheric air ; often, too, it is united with watery vapour. Gannal affirms, that the workmen in a bleaching establishment, who suffered under *diseases of the chest*, were visibly improved, and ascribed the amelioration to the inhalation of air containing chlorine. He, therefore, instituted various experiments on consumptive individuals, from which good results, he conceived, followed. Sir James Murray† also mentions, that a friend of his had observed similar effects among his workmen who were exposed to the inhalation of watery vapour strongly impregnated with chlorine. The experiments, however, which were instituted at La Charité, in Paris, on this mode of treating *phthisis*, were by no means encouraging ; and the same may be said of those at the Hôtel Dieu of that city, instituted by Rullier.‡ In many cases, indeed, the disease appeared to be aggravated. Bayle, likewise, thought the inhalation of chlorine generally unfavourable, although he asserts that he cured a case of *tubercular phthisis* with it. Recently, it has been recommended by Cottureau.

Professor Albers,§ of Bonn, who administered it repeatedly, and carefully watched its effects, conceives, that it acts as a stimulant when applied to the membrane, but that, when it gets into the blood, its effects are antiphlogistic ; and he is of opinion, that, when there is no hæmoptysis, or violent local irritation present, chlorine inhalations may be used in diseases of the lungs and air-passages. Its stimulant effect gradually diminishes, and, after a

* Pereira, *Elements of Materia Medica*, &c. 2d edit. i. 228, Lond. 1842 ; or Amer. edit. by Dr. Carson, Philad. 1843.

† A Dissertation on the Influence of Heat, &c. Lond. 1829 ; cited in the *Dublin Journal of Medical Science*, for March, 1839, p. 96.

‡ See, also, Pereira, *Op. cit.* p. 229 ; and E. J. Coxe, *Practical Treatise on Medical Inhalation*, p. 83. Philad. 1841.

§ *Hannoversche Annalen*, 1836, and *Brit. and For. Med. Rev.* for July, 1837, p. 215.

time, the mucous surfaces of the lung become less sensible to its exciting influence. In tubercles of the lung, in chronic catarrh, in chronic inflammation and ulceration of the bronchial mucous membrane, and in dilatation of the bronchi, he found it of no service, and, in most cases, it could not be borne, in consequence of the irritation it induced; but its operation was very salutary in *pure ulceration of the lungs* or *vomica*. It had always, however, to be administered cautiously and experimentally.

Dr. Stokes always found chlorine inhalations prejudicial in *phthisis*, producing, in every case, increase of bronchial irritation, dyspepsia, and arrest of the pulmonary secretion. In his trials of the remedy in *gangrene of the lungs*,* he found it decidedly beneficial, correcting the fœtor of the breath and expectoration, and, therefore, calculated to obviate not only the local but the constitutional symptoms.

Sir James Clark† is of opinion, that the inhalation of chlorine has only produced relief in persons whose lungs have been diseased to a very limited extent. Dr. A. T. Thomson‡ considers it “the best topical expectorant, and the most salutary excitant to the mucous membrane of the lungs that has yet been inhaled;” and Dr. Christison§ affirms, that he has tried the practice repeatedly; and although, like Dr. Elliotson, he has witnessed “such amelioration as he never saw before under the use of narcotics or any other means,” he has not met with any instance where the amelioration was permanent. Such, likewise, has been the experience of the author.

Dr. Pancoast informed the author, that a case of *aphonia*, occurring in a young lady, in which there was but little voluntary power over the diaphragm, was cured by the inhalation of chlorine, after the galvanic plates and the electro-magnetic apparatus had been used in vain.

Chlorine may be inhaled from a common dish or inhaling apparatus, by dropping any of the acids on a mixture of chlorinated lime, so that the chlorine may be disengaged slowly; but the best method of inhaling it, as well as iodine, is that recommended by Dr. Corrigan.|| He properly remarks, that, in order for inhalation to have a fair trial, it is requisite, *first*, That the apparatus should be simple in its construction, and easily kept in order. *Secondly*, That it should be capable of keeping up a supply of vapour for any length of time, and that the evolution of the vapour should be steady and easily regulated. *Thirdly*,

* Dublin Hospital Reports, vol. v.

† Treatise on Tubercular Phthisis, p. 84, Lond. 1834; also, Amer. edition, Philad. 1835.

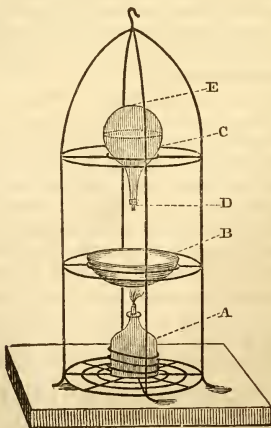
‡ Elem. of Mat. Med. and Therap. 2d. edit. Lond. 1835.

§ Dispensatory, p. 212. Edinb. 1842.

|| Dublin Journal of Medical Science, March, 1839, p. 94.

That it should also furnish a sufficient supply of aqueous vapour to prevent any irritation of the larynx, or lining membrane of the air-tubes; and, *fourthly*, and most important of all, that its employment should entail neither trouble nor fatigue on the invalid.

To fulfil these objects, Dr. Corrigan advises the apparatus represented in the figure beneath. It consists of a light open iron-wire frame, about eighteen inches high, at the bottom of which is a spirit lamp, A: at the proper height above it is an evaporating porcelain dish, about six inches in diameter, B: above this is a glass globe, C, with its neck downwards. In the neck of the globe is a cork, D, bored, and through the opening is drawn, moderately tight, a short plug of cotton wick, such as is used in a spirit lamp: in the glass globe at E, opposite the neck, is drilled a pin-hole, to allow air to pass in, according as the fluid within drops out through the neck. To use it, the porcelain dish is filled with hot water, the spirit lamp is lighted, and as soon as the water in the dish has begun to boil, the glass globe containing chlorinated lime, (if this be the substance used,) is placed as in the illustration below. The rate, at which the fluid in the globe shall percolate the cotton wick and drop into the hot water beneath, is easily regulated. If it should not drop with sufficient rapidity, one or two of the threads of cotton may be removed. Should it drop too rapidly, this is corrected by pressing in the cork more tightly, or introducing one or two additional threads of wick.



Eight ounces of a saturated solution of *chlorinated lime* may be poured into the glass globe; and into the water of the porcelain dish, two ounces of the *dilute sulphuric acid* of the pharmacopœia. As the solution drops, the acid seizes on the lime, and the chlorine is evolved in connexion with aqueous vapour.*

Chlorine is but little used in this form, and can only be adapted for cases in which the pathological condition of the bronchial mucous membrane, or neighbouring parts, requires the exhibition of an excitant.† In this way, it may be occasionally serviceable in *chronic bronchitis*; but its administration requires great caution.‡ In cases of poisoning by hydrocyanic acid, as well as by sulphuretted hydrogen, chlorine is a most efficacious agent. Chlorinated of lime may be used for this purpose.

2. *By Fumigation.*—Fumigations of chlorine have been particularly recommended by Dr. Wallace, of Dublin.§ They appear to resemble, in their action, the nitrous and nitro-muriatic acid baths,|| and have been especially employed in *liver diseases*, unaccompanied by inflammation, but in which there is a disturbance of the biliary secretion. According to Wallace, fumigations of chlorine are more certain than ablutions and baths of nitro-muriatic acid, and they have the advantage, that their application subjects the patient to less inconvenience. The good effects of chlorine, in such cases, have likewise been tested by Zeise,¶ in his bathing establishment at Altona. When chlorine is brought into contact with the skin, in this way, it soon occasions a pricking sensation; increase of transpiration; great afflux of fluids to the surface of the body, and sometimes a pustular eruption; increased secretion of saliva, urine, and bile; slight inflammation of the mouth and fauces, and impeded respiration and circulation.

Dr. Mettauer is disposed to refer the action of the compound, in every case, to the presence of chlorine, and to believe with Dr. Scott, of India, who first introduced the nitro-muriatic acid to notice, about twenty-six years ago (1817), that a solution

* Lond. Med. Gaz., April 6, 1839, p. 49.

† Toulmouche, in *Revue Médicale*, Avril, 1834. See, on the various modes of inhalation, Sir C. Scudamore, in *Lond. Med. Gaz.* Feb. 7, 1840, and Dunglison's *Amer. Med. Intel.* April 15, 1840, p. 25; and E. J. Coxe, *Practical Treatise on Inhalation*. Philad. 1841.

‡ *Archives Générales*, Avril, 1834; and a communication on the excellent effects of chlorine vapour in catarrh, in *Gazette Médicale de Paris*. June, 1838.

§ *Researches respecting the Medical Powers of Chlorine, &c.* Lond. 1822.

|| See, on the Nitro-Muriatic Mixture, as a remedial agent, Dr. J. P. Mettauer, *Amer. Journ. Med. Sciences*, Feb. 1840, p. 291.

¶ *Nye Hygea udgivet af C. Otto*, 1825, and Hufeland und Osann's *Journ. der prakt. Heilkund.* B. lxxiii. St. 1.

of chlorine in water will answer, in all cases, as well as the acid.

In the last edition of the Pharmacopœia of the United States, the following formula has been introduced for the preparation of the ACIDUM NITRO-MURIATICUM. Take of *Nitric acid*, f.℥iv., *Muriatic acid*, f.℥viij. Mix them in a glass vessel, and, when effervescence has ceased, keep the product in a well stopped glass bottle, in a cool and dark place.

Dr. Wallace found chlorine fumigations serviceable not only in *hepatic diseases with disordered secretion of the liver*, but in several other morbid conditions, as *hypochondriasis*, *cachexia*, and in all affections in which a prolonged excitation of the skin, and a restoration of its suppressed or impaired functions are esteemed serviceable,—hence, in *old cases of syphilis*, *scrophula*, *chronic catarrh*, and *rheumatism*. Generally, cathartics were combined with the fumigations, and the evacuations were constantly observed to present a highly bilious character.

In *chronic cutaneous affections*, as in *lepra*, *psoriasis*, and *scabies*, these fumigations have been found useful; but, generally, fumigations of sulphurous acid are employed by preference, in consequence of the greater facility with which they can be prepared.*

Injections of chlorine gas have been employed for the radical cure of *hydrocele* by M. Deblois, of Tournay, and M. Decondé.† The chlorine gas is contained in a bladder, to which is attached a pipe and stopcock adapted to the canula of the trocar, into which it is fixed after the fluid is evacuated: the stopcock is then turned, and the bladder pressed so as to force the gas into the tunica vaginalis. When this is distended, the pipe and bladder are removed, and the thumb is placed over the mouth of the trocar, so as to prevent the issue of the gas for the space of two minutes; it is then allowed to pass, and two or three repetitions of the injection are made, which are sufficient for the cure. It would appear, that risk must be incurred from the injection of such an acrid substance, but M. Decondé says not.

Fumigations of chlorine, with the view of *destroying the matter of contagion*, and of *preventing the spread of contagious diseases*, have long been used.‡ As long ago as the year 1773, they were proposed for these purposes; and were subsequently extensively used by Guyton de Morveau; hence they have been called the "*Guytonian*," or the "*Guyton Morveau fumigations*." They are the best agents that we possess.

* Green on Diseases of the Skin. Dunglison's American Library edit. Philad. 1838.

† Bulletin Médical Belge, Janvier, 1836.

‡ Link, Art. Chlor, in Encyclopäd. Wörterb. der medicin. Wissenschaft. B. vii. S. 575. Berlin, 1831.

In fumigating the extensive general penitentiary at Milbank, Westminster, Dr. Faraday adopted the following method. One part of *common salt* was intimately mixed with one part of *black oxide of manganese*; the mixture was placed in a shallow earthen pan, and two parts of *oil of vitriol*, previously diluted with two parts by measure of *water*, were poured upon it, — the whole being stirred with a stick. Chlorine was liberated for four days. The quantities of the ingredients employed were 700 pounds of common salt, the same quantity of the oxide of manganese, and 1400 pounds of sulphuric acid.*

When chlorine is evolved in the manner described, it is liable, like all the acid gases, to the objection, that it is extremely irritating when respired. It cannot, therefore, be used in the sleeping apartments of the sick, although it may be employed beneficially after they have been withdrawn, and the object is to disinfect the chamber. It ruins all polished surfaces, but this can be effectually obviated by painting them over with a compost of starch. The chlorides are not liable to the same amount of objection, as they exhale the chlorine slowly.†

XLVII. CHLO'RINI AQUA.

SYNONYMES. Aqua Chlorinii, A. Chlorinei, Solutio Chlorinii, Liquor Chlori, Aqua Chlori, Aqua Oxymuriatica, Liquor Acidi Muriatici Oxygenati, Aqua Oxygenata Muriatica, Aqua Oxygeno-Muriatica, Liquor Alexiterius Oxygenatus, Solutio Alexiteria Oxygenata, Solution of Chlorine, Liquid Oxymuriatic Acid.

French. Chlore Liquide, Eau de Chlore.

German. Chlorwasser.

This preparation is contained in many of the pharmacopœias. It is in those of Austria and Anvers; and in the Batavian, Bavarian, Belgian, Danish, Dublin, Edinburgh, Parisian, Finnish, Hanoverian, Polish, Prussian, and Swedish.‡ It has been more extensively administered on the continent of Europe than in this country, or in Great Britain.

* Pereira, Op. cit. p. 228.

† See the author's General Therapeutics, p. 509. Philad. 1836; and his General Therapeutics and Mat. Med. ii. 376. Philad. 1843.

‡ Pharmacopée Universelle, i. 405. Paris, 1828.

METHOD OF PREPARING.

The Prussian Pharmacopœia directs *chlorine gas*, made after the manner before described, to be passed into the bottles of a Woulfe's apparatus filled with *distilled water*, until two-thirds of the water are displaced: the bottles are corked under water, and the water is agitated until it takes up the gas. The liquid is then drawn off into small bottles, which are well filled, and kept in a dark place. In this way, liquid chlorine may be kept for a long time undecomposed. In its preparation, some little chlorohydric acid is formed, so that it has at times to be purified by treating it with a solution of nitrate of silver.

The process of the Dublin Pharmacopœia is similar to this. That of the Edinburgh Pharmacopœia differs; and is as follows:—Take of *Chloride of sodium*, sixty grains; *Sulphuric acid* (commercial), two fluid drams; *Red oxide of lead*, three hundred and fifty grains; *Water*, eight fluid ounces. Triturate the chloride of sodium and oxide together; put them into the water contained in a bottle with a glass stopper; add the acid, and agitate occasionally till the red oxide becomes almost white. Allow the insoluble matter to subside before using the liquid.

EFFECTS ON THE ECONOMY IN HEALTH.

From experiments made by Orfila* on dogs, it appears, that considerable doses of a moderately concentrated solution of chlorine prove fatal, by exciting sooner or later inflammation of the stomach, accompanied with great languor; and when death takes place very rapidly, signs of organic alteration are met with in the stomach. In its action on the economy, chlorine is closely allied to the acids, and especially to the chlorohydric. Introduced into the stomach in moderate doses, solution of chlorine excites an agreeable feeling of warmth, which soon spreads over the whole of the body: in strong doses, according to L. W. Sachs, a kind of intoxicating stupor is induced by it, soon succeeded by prostration. It has been conceived to act equably as a moderate excitant of the nervous system, and thereby to moderate inordinate action in any part; and is, to a certain extent, antiphlogistic, without possessing any of the debilitating qualities of the antiphlogistics proper. In the opinion of some of the German pathologists, it powerfully stimulates the organic actions, especially the lymphatic and glandular systems, moderating inordinate secretion. Its antiseptic properties are likewise considerable.

* Toxicologie Générale, i. 141.

It would appear, however, that the number of observations has not been sufficiently great — although they have been by no means few — to allow of any comprehensive appreciation of its exact *modus operandi* on the human organism.*

EFFECTS ON THE ECONOMY IN DISEASE.

Although solution of chlorine is properly no new remedy, it is only of late years that it has been frequently administered. At the present day, in some countries, it is in common use. It is not long since Meurer maintained, that it is impossible to administer chlorine internally, and that in every case in which it was believed to have been given, the article really taken was the chlorohydric or muriatic acid; for, owing to the affinity of chlorine for hydrogen, whenever any union takes place between it and organic matters, the chlorine, he affirmed, disappears, and chlorohydric acid alone exists, as he had proved by repeated experiments. In this assertion, however, he was opposed by many observers. Herzog and Bärmann came forward with experiments to show, that Meurer had gone too far in his deductions; and from all the experiments, it would appear, that in prescribing *aqua chlorini* many mistakes had been, and — we may add — still are, committed. From Bärwald's experiments, it would appear, that if water which has rested on aromatic or other vegetable substances be chosen for the dilution of the solution of chlorine instead of distilled water, a difference is produced in the rapidity of the decomposition. In a mixture of *aqua chlorini*, distilled water, and simple syrup, the decomposition takes place tardily; but if, in place of syrup, a mucilaginous juice be substituted — for example, the *syrupus althææ* — acids are speedily formed; as well as when a decoction of althæa is substituted for distilled water; whereas a mixture of the decoction of salep, (gr. v. to water ʒj.) syrup, and *aqua chlorini*, in well stopped bottles, remained undecomposed above twenty-four hours. In these experiments, however, the persistence of the smell and taste of the chlorine exhibited, that the whole of the chlorine had not been converted into chlorohydric acid. In the same manner as in the case of the decoction of marshmallows, the addition of *Infusum sennæ* and *Infusum valerianæ*, as well as of the solutions of extracts, and especially of liquorice, destroyed the smell of the *aqua chlorini* instantaneously, even when the taste of chlorine could still be detected. When the solution was combined with remedial agents, that contained much colouring matter, the decomposition took place with great

* Riecke, Die neuern Arzneimittel, u s. w. S. 30. Stuttgart, 1837.

rapidity. From the results of these experiments, Bärwald advises *aqua chlorini* to be given in admixture with distilled water and simple syrup, as in this way only can we be sure, that the patient has taken the chlorine undecomposed. Herzog lays it down as a rule, that the solution of chlorine should only be mixed with colourless transparent substances — water, simple syrup, gum arabic or decoction of salep.

In respect to its administration in disease, it may be well to speak first of its internal use, which, in several morbid conditions, seems to have rendered good, and in some cases eminent, service. The following are the diseases in which it has been chiefly recommended.

1. *Irritative fever*, as in the violent irritative fever that occurs during the period of dentition; in which it has been administered with great success by Kopp, Mehlhausen, Guden, Trusen, and Riecke.* Dangerous determinations to the head have been, in this way, obviated, along with the unpleasant complications which are apt to be occasioned thereby. Toëlt exhibited it in *convulsions, during dentition*, which were accompanied by too great activity of vessels; and he affirms, that he has prescribed no remedy, which, in all respects, answered so well.

2. *Nervous fever*, especially when tending to the putrid character. In the *plague*, according to Wagner, it is of no avail; but in *putrid fever*, according to Kopp, it is highly useful. Spangenberg observed good effects from it in an *epidemic typhus* with hepatic derangement. It is likewise extolled in *typhus* by Wolf, Braun, Hufeland, and others; and by Sacco in the fever called *petechial*, — itself a typhus. Of late, it has been much used in Germany in *typhus abdominalis*, which corresponds to our *typhoid fever*, to oppose the origin and development of the intestinal ulcerations; but when the disease is farther advanced it has been found useless. It is especially recommended in this disease by Clemens, but he commonly premised the use of an emetic. Trusen considers the emetic unnecessary. He first applies leeches to the epigastrium, and then prescribes immediately *aqua chlorini* in considerable doses; — in lighter cases, a dram every two hours; and if the disorder of the head be already great, the tongue chapped (*rissig*), and the peculiar expression of countenance present, he gives two drams every two hours. Bartels is less satisfied with the action of chlorine in *abdominal typhus*. It raises, he says, the sinking powers very speedily, but often excites the sanguiferous system, but not unfrequently increases the abdominal symptoms so palpably, that the physician is compelled to have recourse to other agents. Riecke†

* Op. cit. S. 30.

† Archiv. d. med. Erfahrung, Marz und April, 1825.

‡ Op. cit. S. 33.

thinks, however, that it may be of essential service in this disease, which so frequently mocks the best directed efforts of the practitioner; and he suggests, that farther experiments are highly desirable, especially as those instituted by Trusen and others are not free from objections, by reason of their having associated with chlorine substances that quickly decompose it.

3. *Carbunculus malignus* (*Milzbrandkarbunkel*). — In the variety of *malignant anthrax* caused by handling the skins of cattle, the internal and external use of chlorine has been found of essential service by Ettmüller, Herbst, Stumpf, and Hoffmann.

4. *Scarlatina*. — Pfeufer, Wendt, Kopp, and Trusen extol it highly in this disease, for which, on theoretical grounds, it would seem to be appropriate, by reason of the great turmoil in the sanguiferous system, as indicated by rapidity of pulse and inordinate secretion of heat, bearing but little direct ratio to the degree of vital energy. Braithwaite, who, it is asserted, was one of the earliest, if not the earliest, that advised chlorine in scarlatina, supposed that it acted as specifically as the bark in intermittent, or mercury in syphilis; and Trusen asserts, that it may be advantageously used in cases where other remedies have been found ineffectual. It is especially recommended by Braun and Spiritus in malignant scarlatina.

5. In other *febrile affections*, — *small-pox, measles, rubeolæ*, &c., it has been prescribed with advantage. In *putrid dysentery*, (*faulige Ruhr*), it is extolled by Nysten and Kopp; and in *intermittent*, by Kopp and Kretschmar. Trusen recommends it in the irregular, and especially in the anticipating forms, where danger exists of their becoming continued. Under its use, he found the paroxysms became regular, with perfect apyrexia, so that the ordinary febrifuges could be given advantageously. In *gastric fever*, Trusen trusted to it solely for the removal of the disease: he found that it corrected the morbid secretions from the mucous membrane of the digestive tube. Other physicians have also derived equally favourable results from its administration in that disease.

6. In *gastromalacia*, it has been prescribed by Rhades, Blasius, and Winter, but as Riecke,* from whom this detail of the experience of the German practitioners has been chiefly taken, properly observes, farther observation is necessary before we can decide as to its efficacy in such cases.

7. In *erysipelas*, especially of children, it has been recommended by Kopp.

8. In *inflammation of the liver*, favourable results were obtained from it in the Children's Hospital of St. Petersburg; and

* Op. cit. S. 34.

it exhibited, in these cases, the analogy to calomel in its action, which has been pointed out by many observers.

9. In *hydrophobia*, it has been used both internally and externally as a preventive, especially by the Italian physicians Brera, Previtali,* Ghisaldoni, Agliati, Arrigoni, Narcisi, and Anelli, whose experience is in its favour. Wendelstädt and Rupprius have likewise published favourably regarding it. It is obvious, however, that much fallacy may arise as to the precise agency of reputed preventives. Every one, for example, who may be bitten by a mad dog is not attacked with hydrophobia; and, unless great caution be used, any article may be regarded as a preventive. This is the main reason, why we have so many preventives of hydrophobia and other diseases.

10. Again:—the solution of chlorine has been advised by Rupprius and Mertzdorf in *dropsy*, especially such as supervenes on the acute exanthemata.

11. In the *diathesis phthisica*, it has been recommended by Göden, and has been affirmed to moderate the *hectic in phthisis*, and to make the remissions more marked. In these cases, it requires to be given in large doses, and to be exhibited for a considerable time.

12. In many cases of *chronic cutaneous affections*, with diminished plastic energy, it has been used with success by Kopp.

13. In *noma* or *cancerum oris*, and in *fætor of the mouth*, it has been recommended internally as well as topically; and, according to the experiments of Persoz, Nonat, and others, it renders eminent service in cases of poisoning by hydrocyanic acid.

Externally, it is used either pure, diluted with water, or in combination with oil. Godier affirms, that he cured *strumous swellings of the glands* by a cerate of chlorine. Eisenmann, Cullerier, and Blache recommend it at times pure, at others diluted, in the way of injection, in *gonorrhœa* and *leucorrhœa*. It is employed, also, in *slabby, putrid, and offensive ulcers*, in *carbunculus malignus*, in *chronic cutaneous affections*, as *tinea capitis*, *itch* (Deimann), *herpes* (Alibert), *cancerum oris*, *asthenic aphthæ*, &c.

Lastly: ablution with a solution of chlorine, or of the chlorides, has been advised as a *preventive of venereal infection*. In *cancerous ulcers*, it corrects the unpleasant odour, and excites a new action in the part; causing the secretion of better pus: farther than this, we cannot expect much from it. Baths of chlorine are recommended by Wagner as an excellent means for preventing the *plague*. Schönlein advises that, in *scarlatina*, the whole surface of the body should be washed with a mixture of

* *Pratiche Osservazioni sull' Idrofobia, &c.* Milan, 1820.

aqua chlorini and water, which he prefers to ablution with cold water.

Finally: — *aqua chlorini* is occasionally sprinkled in the sick chamber, to *purify the atmosphere* during the prevalence of contagious or other diseases.

MODE OF ADMINISTERING.

As already remarked, whenever *aqua chlorini* is prescribed, its facility of decomposition must be borne in mind. It is, for this reason, best to prescribe it with water only,* or at most with the addition of simple syrup, for internal administration. For external use, water alone should be associated with it. As to the precise mode in which chlorine is affected by fatty substances, we have as yet no accurate knowledge; it may be calculated, however, that a part undergoes decomposition. Such combinations have, notwithstanding, been found very useful.

The solution should never be prescribed in quantity larger than is necessary for twenty-four hours, as by frequently opening the vessel in which it is contained, decomposition readily ensues. The vessel should be put into a dark place, and be surrounded by black paper.

The average dose for an adult, in the twenty-four hours, may be fixed at an ounce, although much larger doses may be given without inconvenience. It is scarcely necessary to say that the precise dose must vary with the degree of concentration.

Unguentum chlorini.

Ointment of chlorine.

Unguentum oxygenatum ex tempore parandum.

R. Aquæ chlorin. p. j.
Adipis, p. viij. M.

Used in *itch*.

Pharmacopœia of Austria.

Linimentum aquæ chlorini.

Liniment of chlorine.

R. Aquæ chlorin. f. ʒj.
Olei olivæ, f. ʒj. M.

Externally, in *obstinate itch*, *tinea capitis*, and *herpes*.

Deimann.

* Lepage, Journ. de Chimie Méd. cited in Encyclog. des Sciences Méd. Janv. 1842, p. 22.

R. Ceræ albæ, ℥ij.
 Leni calor. liquef. adde
 Ol. amygdal. q. s.
 Ut fiat linimentum cui refrig. adde
 Aq. chlorin. ℥iss. M.

Used externally in *ulcers*.

Ludwig.

Gargarisma aquæ chlorini.

Gargle of chlorine.

R. Tragac. pulv. gr. xij.
 Aquæ, f.℥iv.
 Aquæ chlorin.
 Syrup. aa. f.℥ss. M.

To be used as a gargle in *ulceration* and *chronic inflammation of the mouth and fauces*.

*Ratier.**

XLVIII. CHONDRUS.

SYNONYMES. Fucus Crispus, Lichen Carrageen, Chondrus Crispus, Sphærococcus Crispus, Ulva Crispa, Chondrus Polymorphus, Irish Moss, Carrageen or Corigee Moss.

French. Mousse d'Irlande, Mousse Pérlee.

German. Krauser Tang, Seetang.

Although Carrageen or Irish moss has long been used in Ireland, it was but little employed in other parts of Europe, or in this country, until within the last few years. Of late, it has been used precisely in those cases in which *Lichen Islandicus* or Iceland moss has been deemed appropriate. In Germany, the first trials were made with it in the year 1833, by Von Gräfe of Berlin, and the results were given to the world in his report for that year,† of the Clinical, Surgical and Ophthalmic Institute, attached to the Frederick William University.

Chondrus, which belongs to the NATURAL FAMILY Algæ, exists in the Atlantic Ocean, on the coasts of England, Ireland,

* Formulaire Pratique des Hôpitaux Civils de Paris, 3me édition. Paris, 1827.

† Bericht über das klinische chir. augenärztliche Institut. der k. Friedr. Wilh. Univers. für d. J. 1833. Berl. 1834.

western France, Spain, and Portugal, and as far as the tropics. It is also said to be a native of the United States. It is met with more abundantly, however, in Ireland, especially in Clare, where it is used by the poor as an article of diet. It is thrown on the shore by the waves, and is gathered at the time of the ebb.*

Irish moss, when fresh, is purple-brown or purple-red, and somewhat resembles the Iceland moss; but when dried, as we meet with it in commerce, it is mostly yellowish or dirty white, but intermixed with purplish-red particles, and resembles laminæ of horn: it is crisped, translucent, and frequently containing small shells, calcareous concretions, and grains of sand. It has not much taste; the smell seems to betray iodine, which, however, has not been detected in it. When the moss is chewed, it feels like so much cartilage, but, by the moisture and warmth of the mouth, it soon loses its brittleness. It contains a little chloride of sodium.†

The jelly obtained from it is transparent and colourless; its taste is by no means disagreeable; it keeps several days, and is not converted by muriatic acid into mucus, like the jelly which is obtained from land plants. It exists in the proportion of 79.1 *per cent.*, and has been considered to consist of pectin in large proportion, and starch; but Dr. Pereira‡ esteems it a peculiar principle, and gives it the name *Carrageenin*. It is easy of digestion, is readily borne by weak and irritable stomachs, and exerts a soothing influence on the air-passages and the intestinal canal.

In order to obtain it, the moss is cut small, carefully cleared from impurities, boiled with the selected vehicle, and strained. Von Gräfe obtained, from nine ounces of milk boiled with half a dram of the moss, five ounces of jelly; and as much from a dram and a half of the moss and twelve ounces of water. The formula, commonly used by him, is given below. To this jelly may be added any dietetic or remedial agent, which may be considered indicated in the particular case.§

Chondrus is in the secondary list of the Pharmacopœia of the United States;—cetraria in the *primary*; but the assignment appears to be arbitrary, as one is perhaps as valuable an agent as the other.||

* Pereira, Elements of Materia Medica and Therapeutics, ii. 874. Lond. 1842; or Amer. edit. by Dr. Carson, Philad. 1843.

† E. Gräfe in Art. Fucus, Encyclopäd. Wörterb. der medicinischen Wissenschaft. xiii. S. 1. Berlin, 1835.

‡ Op. cit.

§ See L. Feuchtwanger, in Philad. Journ. of Pharm. vi. 204. Philad. 1833-4.

|| See the Author's General Therapeutics and Mat. Med. ii. 248. Philad. 1843.

EFFECTS ON THE ECONOMY.

Chondrus is used in the affections that are considered to be benefited by Iceland moss. As a diet, it is given in *consumptive cases*, and wherever there is *erethism in the respiratory or digestive apparatus*. It is sometimes prescribed in *diarrhœa* along with astringent or other remedies. The jelly has been advised as a diet in scrophulous cases. Von Gräfe affirms, that he has often found it serviceable in *hoarseness, dry spasmodic cough, consumption, diarrhœa, and dysentery*: in the *intestinal pain, which remains after inflammation and ulceration of these parts, and after poison has been taken*; in *diseases accompanied by much emaciation*, and in the *prostration ensuing on serious diseases and operations*. In similar affections it has been extolled by Hufeland.* On the other hand, Heyfelder affirms, that he, and many physicians of his acquaintance have used the moss without either good or evil results in *phthisis*, as well as in *erethism of the respiratory and digestive organs*; and Riecket† remarks, that as it makes a very agreeable jelly, when boiled with milk, and with the addition of a little of the *aqua lauro-cerasi*, it may do for cases where we must prescribe “*ut fecisse aliquid videamur.*”

The truth is, that it can render no more service than other substances, which contain a similar principle; and, accordingly, but few prescribe it with any other view than as a demulcent and nutritious aliment, in cases where such is needed.

MODE OF ADMINISTERING.

Decoctum chondri.

Decoction of Irish moss.

R. Chondri (elect. et concis.) ʒss.

Lact. recent. f. ʒix.

Coq. ad remanent. colatur. f. ʒv.

Adde

Sacchar. ʒss. ad ʒj.

Aq. amygdal. amar. concentr. ʒi.

To be taken in the course of the day.

Von Gräfe.

* Hufeland und Osann's Journ. der Practisch. Heilkund. B. 77, St. 5, p. 135.

† Die neuern Arzneimittel. Stuttgart, 1837, S. 235.

R. Chondr. (elect. et concis.) ℥iss.
Coq. cum aq. font. f.℥xij. ad remanent. colat. f.℥v.
Syrup. rubi. idæi, f.℥iss. ad f.℥ij.
Aq. amygd. amar. concentr. ℥j.

To be used through the day. When employed as diet, Von Gräfe allows from ten to eighteen ounces of the jelly in the day.

R. Chondr. (elect. et concis.) ℥ss.
Coque cum aq. font. q. s. ad reman. f.℥vj.
Colatur. adde
Sodæ phosphat. ℥iss.
Syrup opii, f.℥ij. ad f.℥iij.

Dose. — A spoonful every two hours in cases of *hæmoptysis*,
between the attacks. *Clarus.*

R. Lactis, f.℥xxiv.
Chondr. (elect. et concis.) ℥iv.
Sacch. ℥j.
Cinnam. cont. ℥j.
Coque per minut. x. leni igne; filtr. et exprime.

Béral.

R. Chondr. (elect. et concis.) ℥ij.
Coque cum lactis Oj. ad consist. gelatin.
Tere cum
Sacch. ℥ij.
Amygdal. amar. No. 2.

To be used in the course of the day, and daily.

Hufeland.

XLIX. CIMICIFUGA.

SYNONYMES. *Cimicifuga Racemosa*, C. *Serpentaria*, *Actæa Racemosa*, *Macrotrys Racemosa*, Black Snake-root, Cohosh, Bugbane, Cohort.
French. Actée, Herbe Saint Christophe.
German. Traubenförmiges Christophskraut.

This plant is a native of the United States, growing in shady and rocky woods from Canada to Florida. SEXUAL SYSTEM, Polyandria Di-Pentagynia; NATURAL ORDER, Ranunculacæ. The root is the part used in medicine. It yields its virtues to boiling water, and was found by Mr. Tilghman, of Philadelphia,

to contain gum, starch, sugar, resin, wax, fatty matter, tannin, and gallic acid, a black colouring matter, a green colouring matter, lignin, and salts of potassa, lime, magnesia, and iron.*

EFFECTS ON THE ECONOMY.

Cimicifuga belongs to the class of Acro-narcotics. Until recently, it is said to have been employed chiefly in domestic practice, as a remedy in *rheumatism, dropsy, hysteria*, and in various *affections of the lungs*, especially such as resemble consumption.† It is noticed here, however, chiefly in consequence of the encomiums that have been passed upon it, of late, as a remedy in *chorea*.

Several cases of this disease, reported by Dr. Jesse Young to have been cured, were published some years ago; and at the same time it was stated, that Dr. Physick had known it prove successful in several instances.‡ Dr. Wood§ also states, that he administered it in a case of chorea, which rapidly recovered under its use, after the failure of purgatives and metallic tonics. He also remarks, that he had derived the happiest effects from it in a case of *convulsions*, occurring periodically, and connected with uterine disorder. More recently, Dr. T. S. Kirkbride,|| has published some cases of success, obtained in the same disease, from its administration; after free purging had been employed. In one successful case, in a girl, nine years old, whose mental faculties were much disordered; and who had lost nearly all power over both her left extremities, — there being, at the same time, irregularity of the bowels, headache, and pain frequently shooting down the left arm, cups were applied to the back of the head and neck once; stimulating pediluvia were prescribed, with friction with salt over the surface of the body, and she was moderately purged every day for a week before the Cimicifuga was begun with. Dr. Kirkbride refers to a very intractable case, that fell under the care of Dr. Otto, and that yielded ultimately to the Cimicifuga. He always purges before he has recourse to it, and general frictions with salt or the flesh-brush, and pustulation with Croton oil over the spine, he believes to be of much value in chronic cases.

Dr. Beadle¶ of New York treated a case successfully in a girl

* Journal of Philadelphia College of Pharmacy, vi. 20; and Dr. Wood, in Dispensatory of the United States, by Drs. Wood and Bache, Art. Cimicifuga.

† Dr. F. J. Garden, Amer. Med. Recorder, Oct. 1823.

‡ Amer. Journ. of the Med. Sciences, ix. 310.

§ Op. citat.

|| American Journal of the Medical Sciences, February, 1840, p. 289.

¶ New York Journal of Medicine and Surgery, July, 1840, p. 191. See,

eighteen years of age. There was considerable gastric derangement, with suppression of the catamenia for nearly five months, from pregnancy. She was put upon the use of *Cimicifuga*, five grains of the powder being given every three hours, and no other remedy except an occasional dose of sulphate of magnesia. There was little improvement in her condition during the day, for nearly a week, after which she improved rapidly and was well in three weeks. The medicine produced no sensible effect.

Allusion has been made to the employment of *Cimicifuga* in popular practice, in cases of *rheumatism*. Like other narcotico-acrids, when pushed, so as to produce catharsis and even slight narcosis, it may unquestionably be of service in acute forms of the disease.* In some parts of the country, it has become a very popular remedy in *coughs*; and Dr. E. G. Wheeler† affirms, that he has found it useful in several cases of severe and *protracted cough*; and especially in the *chronic cough* or *bronchitis* of old people.

Dr. Wheeler states farther, that by some eminent physicians, it has been thought to be a good substitute for ergot in *parturition*, being dissimilar, however, in its mode of action, — relaxing the parts and thereby rendering labour short and easy; which requires confirmation.

Recently, it has been advised by Dr. C. C. Hildreth‡ “in *acute phthisis*, uncomplicated with much inflammation in the vesicular structure, or pulmonary mucous or serous membranes;” who states, that he has “often seen the most prompt action of the decoction alone, in throwing off febrile excitement or the hectic paroxysm, allaying cough, reducing the rapidity and force of the pulse, and inducing gentle perspiration.” “In those intercurrent congestions and inflammations, so frequent in the second and third stages of phthisis, from atmospheric exposures,” he states, that he has “often seen the same happy influence exerted;” but the testimony in regard to its beneficial action in these cases is certainly wanting in precision.§

MODE OF ADMINISTERING.

The dried root of *cimicifuga* may be given in powder. Dr. Kirkbride administered it in the dose of a tea-spoonful; and Dr.

also, Dr. C. C. Hildreth, *Amer. Journ. of the Med. Scienc.* Jan. 1843, p. 31; and Dr. F. J. Garden, *Ibid.* p. 247.

* Drs. E. A. Anderson, and Alexander Vedder, in *Dunlison's American Medical Intelligencer*, vol. ii. p. 296. Philadelphia, 1839. Also, *Boston Medical and Surgical Journal*, Oct. 2, 1839, p. 126.

† *Boston Med. and Surg. Journal*, Sept. 4, 1839, p. 65.

‡ *Amer. Journ. of the Med. Sciences*, Oct. 1842, p. 288.

§ See the Author's *General Therapeutics and Mat. Med.* ii. 195. Philad. 1843.

Wheeler in the dose of ʒj . from three to five times a day. It is most commonly, however, given in the form of the

Decoetum cimicifugæ.

Decoction of black snake-root.

R. Cimicifug. contus. ʒj .
Coque paulisper in
Aquæ, Oj.

Dose. — One or two fluid ounces — two to four table-spoonfuls — several times a day.

Tinctura cimicifugæ.

Tincture of black snake-root.

R. Cimicifug. contus. ʒiv .
Alcohol (.835), Oj.

Dose. — Twenty drops three or four times a day. An idea prevails that the stronger the alcohol the better is the preparation, but this may be questioned.

L. CINCHO'NIA.

SYNONYMES. Cinchonina, Cinchoninum, Cinchonin, Cinchonine.

Although Duncan, of Edinburgh, Reuss, of Moscow, and Gomez,* of Lisbon, had endeavoured to separate the active principle of the cinchonas, and had given the term *cinchonine* to a resinous extract obtained in their investigations, the honour of discovering both cinchonia and quinia, and of applying them to practical purposes belongs to the French chemists — Pelletier and Caventou.†

Cinchonia is commonly obtained from the gray or pale varie-

* Richter's *Specielle Therapie*, B. x. S. 325. Berlin, 1828; and Magendie's *Formulaire*.

† *Annales de Chimie et de Physique*, xv. 289 and 337.

ties of cinchona ; the yellow furnishing the quinia, and the red both cinchonia and quinia. It is an alkaloid strikingly analogous to quinia in its chemical and medical relations, but is not as much used.

METHOD OF PREPARING.

Cinchonia is obtained by boiling *cinchona* in *alcohol*, until it loses all its bitterness ; the alcoholic solution is then evaporated to dryness in a water bath ; the extract, thus obtained, is dissolved in *boiling water*, strongly acidulated with *muriatic acid* ; an excess of *calcined magnesia* is added, which, after a few minutes' boiling, will fix all the red colouring matter, and render the liquid clear. When cold, the liquid is filtered, and the magnesian precipitate washed with *cold water* ; it is then dried in a stove, and all the bitterness separated by repeated digestions in *boiling alcohol* ; the alcoholic liquors are mixed, and the cinchonia crystallises as the fluid cools. Cinchonia, thus obtained, still contains a green fatty matter, which may be separated by solution in a very weak acid. If the acid be too strong, it will dissolve a part of the fatty matter, and the intended object will be thus defeated.*

Cinchonia may also be obtained by treating *pulverised pale cinchona* by weak *sulphuric acid*, precipitating the solution by means of *lime* in excess ; collecting the precipitate on a filter, washing, and treating it, after drying, with *boiling alcohol*.†

Cinchonia is white, translucent, crystallising in needles ; requiring, for its solution, 700 parts of cold water, according to Magendie ; according to others, 2500 parts of boiling water. On account of its very sparing solubility in water it has but a slightly bitter taste. In alcohol, it is readily soluble, and the solution is extremely bitter, as well as the salts formed by its union with acids, which resemble the salts of quinia. It does not dissolve readily in fixed or volatile oils, or in ether. At a certain temperature, it volatilises ; a great part, indeed, is destroyed by the operation, yet a sensible portion escapes the decomposing power of the caloric.

In medicine, pure cinchonia, as well as the sulphate and acetate, is prescribed. The sulphate is soluble in 54 parts of water, and in 6.5 parts of alcohol (s. g. 0.815) : it is not soluble in ether. It forms crystals and tastes bitter. The acetate, on the other hand, does not crystallise ; and is less soluble in water than the sulphate ; but an excess of acid facilitates the solution.

* Magendie, Formulaire, &c.

† Pharmacopée Universelle, i. 414. Paris, 1828.

EFFECTS ON THE ECONOMY.

It is not necessary to say much on the application of cinchonia and its preparations to disease, as they have been almost wholly superseded by quinia and its salts. It is a weaker article, and therefore requires to be given in larger doses; Magendie and Gittermann assert, that it has been found ineffective as an anti-periodic. Bally,* Chomel,† Mariani,‡ Wutzer,§ and others. however, have exhibited it successfully.¶ Dufresne¶ frequently prescribed it, and he assigns it this claim to preference, that it is almost tasteless, or at least that the bitter taste is but tardily developed; and that it need not be given in combination with acids, as the acid contained in the gastric secretions will render it soluble.** He gave it in *intermittents*, during the apyrexia, in the quantity of from six to twenty grains, and he found it of marked use in the cases of *gastralgia with formation of acid*, which are so often met with in young females, and are not unfrequently associated with leucorrhœa, hypochondriasis, melancholy, &c.

MODE OF ADMINISTERING.

The following formulæ have been recommended, but, as was before remarked, they are rarely used, the preparations of quinia being now almost universally prescribed.

Syrupus cinchonix.

Syrup of cinchonia.

R. Cinchonix sulphat. gr. xlviij.
Syrup. Oj.

Used in the same cases as the *Syrupus quiniæ*; a table-spoonful for a dose.

Magendie.

* Nouv. Biblioth. Médicale, ix. 189.

† Nouv. Journ. de Médecine, Mars, 1821.

‡ Osservaz. sulla Pratica del Solfato de Cinconina, &c.

§ Rust und Casper's Krit. Repert. B. xxi. and Bulletin des Sciences Médic. Sept. 1827.

¶ Art. Cinchonine, in Mérat and De Lens, Dict de Mat. Méd.

¶ Bibliothéque Universelle, Mai, 1831, p. 89.

** See, also, Ganz, in Bulletino delle Scienze Mediche di Bologna, Agosto et Settembre, 1836, p. 121.

Vinum cinchonix.

Wine of cinchonia.

- R. Cinchonix sulphat. gr. xvij.
Vini Maderens. Oij.

Magendie.

Tinctura cinchonix.

- R. Cinchonix sulphat. gr. ix.
Alcohol (34° or s. g. .847), f. 3j. M.

Magendie.

Magendie recommends, that this tincture should be used for preparing, extemporaneously, the *wine of cinchonia*, by adding two ounces of the tincture to a pint of Madeira wine.

Boli cinchonix.

*Boluses of cinchonia.**Boli antifebriles.**Febrifuge boluses.*

- R. Cinchonix sulphat. gr. iij.
Micæ panis,
Mellis,
Glycyrrhiz. aa. q. s. ut fiat bolus.

Dose. — One, every two hours.

*Brera.**

Mistura cinchonix.

Mixture of cinchonia.

- R. Cinchonix sulphat. gr. vi. ad xlvij.
Potassæ acetat.
Sacchar. aa. 3ss.

Solve in

Aquæ anthemid. 3vj.

Dose. — A table-spoonful every two hours, in *intermittents*.
Sundelin.

* Ricettario Clinico di Brera. Padov. 1825.

LI. CODEIA.

SYNONYMES. Codeina, Codeinum, Codeine.
 German. Kodein.

Although opium had been repeatedly examined by the chemists, and certain of its active constituents separated from it, it was not until within the last few years, that the article, whose name is at the head of this paragraph, had been obtained from it. It was discovered by Robiquet in 1832,* and as it has been exhibited as a therapeutical agent, it requires notice.

METHOD OF PREPARING.

According to Winkler,† this new alkaloid may be prepared in the following manner. Morphia is first thrown down from a solution of *opium*, made in the cold, by means of *ammonia*; the meconic acid is precipitated by the *chloride of calcium*; for the removal of the colouring matter, the fluid is then treated with the *extract* or *subacetate of lead*; and the extract of lead contained in the fluid poured off from the precipitates, is afterwards decomposed by *sulphuric acid*; the fluid, separated from the sulphate of lead, is now treated with an excess of *caustic alkali*; the mixture is exposed to the air until the excess of free alkali has attracted carbonic acid from it: it is then agitated and digested with ether, and left to evaporate spontaneously, after which a yellowish, highly transparent, but not crystalline compound remains, which forms with muriatic acid a crystalline salt, and resembles exactly the codeia of Robiquet.

Merck‡ procures codeia in a very simple manner. He treats morphia, precipitated by soda, with *cold alcohol*; the spirituous tincture is carefully saturated with *sulphuric acid*; the alcohol drawn off, and the residue treated with *cold water* as long as it is turbid; it is then filtered, and the filtered liquid evaporated until it has the consistence of syrup: on cooling, *ether* is poured over it in a large flask; *caustic alkali* is added in excess, and the whole strongly agitated. The ethereal mixture is then so saturated, that codeia crystallises from it in a few hours. By

* Journal de Pharmacie, xix. 21 and 162. Paris, 1833.

† Buchner's Report, xlv. p. 459, cited in Journal de Pharmacie, xxi. 251. Paris, 1835.

‡ Journal de Pharmacie, cited in Amer. Journal of Pharmacy, new series, i. 171. Philad. 1835.

evaporating the ether, and treating the residue with *alcohol*, the codeia is obtained, by degrees, wholly pure, and separated from an oily matter, which is a great obstacle to crystallisation.

Codeia, according to Pelletier, consists of 31 parts of carbon; 40 parts of hydrogen; 5 parts of oxygen, and 2 of azote. It is an alkaloid, soluble in water, alcohol and ether; but not so in alkaline solutions. It unites readily with acids, and, with the chlorohydric especially, forms a salt, which crystallizes with great facility. When the crystals of codeia are heated on a plate of platinum, they burn with a flame without leaving any residue. Heated in a tube, they melt at about 150° centigrade; and, if allowed to cool immediately, they form a crystalline mass; if, however, the heat be continued, the oleaginous fluid rises along the sides of the tube, appearing to shun the heat; but it does not volatilise. When dissolved in water, codeia communicates to it decidedly alkaline properties. 1000 parts of water at 60° Fahrenheit, dissolve 12.6 parts of codeia; the same quantity at 100°, 37 parts, and at 212°, 58.8 parts. If more codeia be added to boiling water than can be taken up, the surplus melts, and forms, like meconin, an oleaginous layer on the bottom of the vessel. This aqueous solution, by careful refrigeration, affords a translucent and uncommonly well defined *metel*. The tincture of galls forms a copious precipitate with a solution of codeia, in which respect, the latter differs essentially from morphia, as it does in many other of its properties.

EFFECTS ON THE ECONOMY.

As morphia does not represent the whole of the activity of opium, Robiquet concluded, that other substances might concur thereto, and he conjectured that codeia might be one of those. Under this idea, Kunkel* instituted experiments with it on rabbits and dogs, from which he obtained the following results. *First*. Codeia differs from morphia in this, that it does not, like the latter, paralyse the lower extremities. *Secondly*. Codeia appears to exert a powerfully excitant action. It occasions convulsions of the limbs, and of the muscles of the neck, and when it produces death, this seems to be owing to its action on the cerebellum and medulla oblongata; twice, he noticed symptoms of backward progression under its use, and those parts after death were found turgid with blood. To judge from the condition of the heart and lungs it affects likewise the circulatory organs. It occasions inflammation of the tissues, with which it comes in immediate contact. Its action is more energetic, when intro-

* Journal de Chimie Médicale, ix. 233.

duced into the cellular membrane, than into the stomach. It seems, also, to exhibit a special action on the urinary organs, for, animals to which it is given never evacuate their bladder as long as they are under its influence. *Thirdly*. The action of codeia differs from that of the watery extract of opium, in not paralysing the hinder extremities; but it approximates it in this, that it acts, as has been said, more powerfully when introduced into the cellular membrane than into the stomach, and accelerates respiration and circulation.

Kunkel, however, remarks upon the results of his experiments, that they demand repeated trials for confirmation, as he was only able to experiment with a very small quantity of the substance. Robiquet observes, that Kunkel's experiments have led to the inference, that when codeia is combined with acids, it loses much of its efficacy — the very opposite, by the way, to the inferences of Magendie.

Barbier* has taken considerable pains to fix the value of codeia as a remedial agent. He prescribed it in the dose of one or two grains in a *syrup*, prepared with the aqueous solution of the alkaloid, of such strength, that a table-spoonful or half an ounce contained one grain of codeia. In his opinion, it exerts a peculiar agency on the nerves of the ganglionic system, whilst it appears to possess but little influence on the hemispheres of the brain, and to make no impression upon the spinal marrow. In the epigastric region, he remarks, the agency of codeia is powerfully manifested; and here in the centre of the ganglionic system, its effects may be investigated, and their extent and magnitude appreciated. If a spoonful, or, at an interval of from one to two hours, two spoonfuls of the syrup of codeia be administered to one affected with the symptoms to be described immediately, it will be found, that it exhibits a considerable and remarkable effect upon the economy. If the person complain of pain in the epigastric region, beneath the lower extremity of the sternum, and stretching to the sides and back; and if, with these symptoms, there is combined a feeling of heat, with indescribable anxiety, marked debility, paleness, decided alteration of the features; a sense of painful traction sometimes on one side, at others on the other of the epigastric region, with tendency to syncope, frequent sighing, despondency, and more or less sensibility to pressure in the epigastric region, &c., Barbier considers the seat of the disease to be the epigastric nervous plexus; and in such cases, he says, he has found no remedy superior to syrup of codeia. He has observed it afford decided relief, where the coats of the stomach were manifestly in a state of degeneration. A common effect of codeia is sleep; which is never accompanied by heaviness of the head, or by determination of blood to the

* Gazette Médicale, Mars 8, 1834.

brain. When the persons awake from the sleep produced by it, the countenance is bright and lively, and there is a tendency to laughter. Barbier was led to believe, that it does not affect the nervous cords connected with the vertebral portions of the centre of the nervous system. In his observations at the hospital of Amiens, he often noticed the neuralgic affection of the abdomen above mentioned to be accompanied by pains in the head, loins, and limbs, and whilst codeia relieved the abdominal uneasiness, it left the others untouched, — a singular circumstance if true, but requiring fresh observation before we can esteem it to be established. He remarks farther, that almost all the patients that were benefited by codeia had used laudanum unsuccessfully. Codeia, he adds, occasions no manifest change in the circulation and respiration; it does not disturb the digestive function; seems merely to diminish the feeling of hunger, and occasions no constipation. During its use, itching of the surface is frequently experienced. When applied to the skin, it induces no striking phenomena. When placed, in the quantity of two grains, on a surface abraded by a blister, it excites a painful sensation of burning, without any other change appearing to supervene; — the neuralgic pains, for the removal of which it may have been thus employed, not appearing to be modified by it.

Dr. W. Gregory made experiments upon himself and some of his pupils with NITRATE OF CODEIA. None of them experienced any effect from a dose of three grains and under; from four to six grains, however, occasioned striking symptoms — quickness of pulse, sense of heat in the head and face, remarkable excitement, like that following the use of intoxicating liquors; agreeable, and apparently permanent, stimulation, accompanied by considerable itching, which began at the head and extended over the whole body. To this succeeded, in the course of a few hours, a disagreeable sense of relaxation, with nausea, and often vomiting. None of the experimenters felt the slightest inclination to sleep, until after the supervention of the feeling of relaxation. Riecke* thinks that these experiments confirm Kunkel's observations, that codeia loses its efficacy when combined with acids.

In the year 1834, M. Martin Solon, at one of the sittings of the Académie Royale de Médecine, when the experiments of Barbier with codeia were the subject of discussion, confirmed his views regarding its soporific property. It appeared to him to allay the *cough of the consumptive*. He remarked, however, that he had not observed the effects on the ganglionic nervous system, which Barbier had witnessed.

* Die neuern Arzneimittel, u. s. w. S. 140. Stuttgart, 1837.

Magendie* took a grain of codeia, dissolved it in a little water, and injected it into the jugular vein of a middle-sized dog, which was immediately thrown into profound sleep — readily broken, however, by any strong noise made in the vicinity of the animal; but the interruption was of brief duration, — sleep soon recurring. This condition persisted for several hours without being accompanied by any unpleasant symptoms. The effect was not the same with the muriate of codeia, a single grain of this salt, introduced in the same manner into the organism, suddenly induced deep sleep; but, after the animal had slept five or six hours, it died. Several similar experiments afforded a like result. Magendie administered codeia in the Hôtel Dieu to different patients. He found that one grain, given once or twice, succeeded, in many cases, in inducing a quiet and soft sleep, to which no confusion succeeded the next day, as is commonly the case with morphia. As respects intensity of action, he compares one grain of codeia to half a grain of morphia. Two grains often excited nausea, and even vomiting. Magendie found the muriate to be decidedly stronger than pure codeia. Two grains commonly induced, besides sleep, vertigo, nausea, and even vomiting; but this dose succeeded like a charm, in cases of *neuralgia faciei* and in *sciatica*, that had resisted the most valued agents.†

Dr. Miranda, of the Havana, has published‡ the results of his experience with codeia in what he calls *powerful nervous irritations of the mucous membrane of the stomach*, and he affirms, that he cured eleven cases by the syrup of codeia alone. He began with a dram of the syrup night and morning, and gradually increased the quantity to an ounce in the twenty-four hours. His success was so striking that he is induced to “regard the discovery of codeia to be fortunate for humanity, especially in climates like that of the Havana, in which gastrites are so multiplied.”

Syrupus codeiæ.

Syrup of codeia.

This is directed by M. Cap§ to be prepared in the following manner: —

R. Codeiæ, gr. xxiv.
 Aquæ destillat. f. §iv.
 Sacchar. §viiij.

Reduce the codeia to an impalpable powder in a glass or por-

* Formulaire pour la préparation et l'emploi de plusieurs nouveaux médicaments. Edit. 9me. Paris, 1836.

† Gully's Translation of the 8th edit. of Magendie's Formulaire. Lond. 1835.

‡ Journal de Pharmacie, xxiv. 145. Paris, 1838.

§ Ibid. xxiii. 418. Paris, 1837.

celain mortar. Triturate with one-third of the water, allow it to settle and decant. Treat the residuum with another third of the water, and again with the remainder. Put the whole into a small matrass, covering the opening with a piece of moistened parchment perforated with a pinhole. Heat in a water bath until the codeia has entirely disappeared. Remove the matrass from the fire to add the sugar; cover the opening again; agitate, and put the vessel again in the bath, until the sugar is completely dissolved.

Each ounce of the syrup contains two grains of codeia.

The MURIATE has been used in this city, but it has not been found to possess any virtues which the salts of morphia do not; whilst its price has been enormous—as much, we are informed, as four dollars the dram.

LII. COL'CHICUM.

SYNONYMES. Colchicum Autumnale, Meadow saffron.

French. Colchique, Tue-Chien, Mort aux Chiens, Safran des Prés, Safran Bâtard, Vieillotte.

German. Herbstzeitlose, Zeitlose, Wiesensafran, Herbstblume.

Meadow saffron is a well-known plant in the temperate parts of Europe, where it grows wild in moist meadows. It belongs to the FAMILY Colchicaceæ; Melanthaceæ (*Lindley*); and to SEXUAL SYSTEM Hexandria Trigynia. The plant is avoided by cattle; and its active poisonous properties have been long known; fatal cases, indeed, still occur every now and then from its employment, not only in animals, but in consequence of its too free use in the treatment of gout. Reynolds, the inventor of the wine of Colchicum, commonly called "*Reynold's Specific*," is said to have killed himself by an overdose of it. A case is given of a man who took, by mistake, an ounce and a half of the tincture, and died in forty-eight hours, after suffering much from vomiting, acute pain in the stomach, colic, purging, and delirium.* The cases of two children are also on record, who were poisoned by a handful of the seeds, and who died in the course of the day, death being preceded by violent vomiting and purging. In the bodies of these children, considerable redness of the mucous coat

* Edin. Med. and Surg. Journal, xiv. 262.

of the stomach and small intestines was found; in other cases, no morbid appearance has been detected.*

A fatal case has been published by Dr. Blumhardt, from the papers of Dr. Neubrandt. The patient, a man aged thirty-two, took by mistake a decoction made of a large table-spoonful of the seeds of *Colchicum* to three pints of water. He was soon afterwards attacked by vomiting, purging, and died two days afterwards under symptoms of narcosis and enteritis.

Another fatal case, which was caused by the leaves of the *Colchicum*,† is referred to, in the same journal.‡

Colchicum is not of modern introduction. It is, indeed, the *Hermodactyl* of the ancients. It had, however, almost wholly fallen into neglect, when its use was revived in Great Britain, in the first quarter of the present century, as an excellent agent in rheumatic and gouty affections. That it is highly esteemed as a therapeutical agent is shown by the number of officinal works into which it has been admitted. Amongst others, it is in the Pharmacopœias of the United States, Austria, Amsterdam, and Anvers, and in the Batavian, Belgic, Brunswick, Danish, Dublin, Spanish, Edinburgh, Paris, Ferrara, Geneva, Hamburg, Hanoverian, London, Lisbon, Russian, Saxon, Swedish, and Wirttemberg.

Several chemists have investigated the composition of the plant. Pelletier and Caventou believed, that they had found veratria in it; but, from the examination of Geiger and Hesse, it appears that the alkaloid, discovered by those gentlemen, was not veratria, but a peculiar principle, *colchicia* or *colchicine*, which is found in every part of the plant; crystallises in slender needles, is inodorous, and of a very bitter, and afterwards biting taste. Introduced into the nose, it does not occasion sneezing like veratria. It has a feeble alkaline reaction; but neutralises acids completely, and forms with them crystallisable salts, which have also a bitter pungent taste. It dissolves with tolerable facility in water.

For therapeutical purposes, the root or bulb, (*cormus*), as well as the flowers and seeds have been administered. The fresh root has a somewhat disagreeable smell, and a bitterish acrid taste. When chewed for any length of time, it excites the secretion of saliva and thirst; destroys the sense of feeling in the tongue; causes a sense of burning in the mouth and lips; constriction of the fauces, hiccup, violent pains in the abdomen,

* Christison on Poisons, 3d edit. p. 791. Edinb. 1836.

† See a case of overdose of *Colchicum*, by Mr. T. A. Henderson, in Lond. Med. Gaz. Aug. 17, 1839, p. 763.

‡ Medicinisches Correspondenzblatt, 1840, and Encyclographie des Sciences Médicales, Mai, 1840, p. 492.

vomiting, diarrhœa, and discharge of blood upwards and downwards.

By drying, the bulbs lose somewhat of their efficacy. The seeds have of late come much into use. They are inodorous, but of a very acrid taste. Their agency is like that of the bulb, and — some think — they are more equable in their effects. To ensure this, however, they must be gathered wholly ripe, when they first become entirely black. They have been highly recommended by Dr. Williams and others.

The flowers are the mildest part of the plant. They have likewise been successfully administered by several English physicians.

EFFECTS ON THE ECONOMY IN HEALTH.

In its effects, colchicum resembles digitalis in one thing, that it renders the pulse less frequent,* according to Thomson and Willis; but, in other respects, Osann and Rieckel† think it agrees more with the squill.‡ In moderate doses, the different parts of the plant that have been mentioned act as diaphoretics, diuretics, and cathartics. On the digestive organs, they are conceived to produce less debilitating effects than the squill.

Sir Everard Home ascribes much of the griping and nauseating effect, that sometimes follows the use of the vinous and other tinctures of colchicum, which have not been carefully filtered, to the sediment which forms in them, and which may be removed without injury to the desired effect of the medicine.§ Sir C. Scudamore,|| however, found the sediment to be inert.

Several experiments were made with colchicum on healthy individuals. In the first case, 160 drops of the vinous tincture of the seeds were taken in 24 hours, by a young man aged 18;—the first dose being 50 drops, the last 60. Seven copious evacuations were produced, with loss of appetite and debility for 24 hours. In the second case, a youth, 17 years old, took 170 drops in 9 hours, in doses of 70, 30, and 40 drops; nausea and vomiting, and six copious evacuations followed. Third case; a youth, aged 15, took 130 drops in 10 hours, and in four doses; the first of 40 drops, and the last three of 30; vomiting and only one stool were the result. Fourth case; a youth, aged 12, took 60

* Art. Colchicum, Encyc. Wörterb. der Med. Wissensch. viii. 136. Berlin, 1832.

† Op. cit. S. 142.

‡ See the Author's General Therapeutics and Materia Medica, i. 289, Philad. 1843.

§ Brande's Dictionary of Materia Medica, p. 189. Lond. 1839.

|| Treatise on Gout, 3d edit. p. 513.

drops in two doses, after an interval of eight hours : nine copious watery evacuations were produced. Fifth case ; a youth, aged 17, took 40 drops at bed time, 30 drops next morning, and 30 drops seven hours after — in all, 100 drops in 19 hours : vomiting and faintness, and five copious evacuations were the result. The same boy afterwards took 70 drops at one dose, which were followed by vomiting and headach, but not by purging. Sixth case ; a boy, aged 10, took 80 drops in 24½ hours, in four doses, of 20, 15, 25, and 20 drops : great sickness and vomiting, and nine evacuations resulted.

EFFECTS ON THE ECONOMY IN DISEASE.

The diseases in which colchicum is recommended, are as follows : —

In *gouty* and *rheumatic cases*, it has been supposed to be almost a specific. Numerous practitioners have testified to its valuable agency in such affections ; among these may be named Mr. Want, Dr. Johnson, Dr. Williams, Mr. Battley, Dr. Armstrong, Sir Everard Home, Sir C. Scudamore, Mr. Haden, Dr. Copland, Dr. Graves, Sir Henry Halford, Dr. Wallis, Dr. Barlow,* and Mr. Wigan,† in England ; and Locher-Balber, Kahleis, Gumpert, Plasse, Weber, Klokow, Biermann, &c., in Germany.‡ In *rheumatic gout*, Mr. Wigan gives it in the dose of eight grains every hour, until “ active vomiting, profuse purging, or abundant perspiration takes place, or at least until the stomach can bear no more.” Thus administered, he pronounces it to be “ the most easily managed, the most universally applicable, the safest, and the most certain specific [?] in the whole compass of our opulent Pharmacopœia.”

Colchicum is presumed to be the active ingredient of the celebrated gout remedy — *Eau medicinale d'Husson* — which has been considered to be formed of two ounces of *colchicum root*, macerated in eight ounces of *Sherry wine* ; the dose being from twenty to eighty drops.

In *acute rheumatism*, as well as in *various inflammatory affections*, colchicum was proposed by the author's friend, Mr. Charles T. Haden,§ as an excellent sedative to reduce excited organic action, which he conceived it capable of effecting to such an extent, that bloodletting might generally be rendered unneces-

* Art. Gout, in Cyclopædia of Pract. Med.

† Lancet, and Med. Gaz., June 30, 1838.

‡ Riecke, Op. cit., and Richter's Specielle Therapie, x. 180. Berlin, 1828.

§ Practical Observations on Colchicum Autumnale in Inflammatory Diseases. Lond. 1820.

sary in febrile and inflammatory disorders;* yet, in the very cases in which it was esteemed so appropriate by Mr. Haden and by Carminati,† it is regarded unadvisable by others. Thus, Riecke,‡ speaking of its use in acute rheumatism, says, that it was at one time given in that disease under the most opposite circumstances, but that it was soon found necessary to restrict its employment within narrower limits, and to preterm it when any considerable febrile condition existed.

The author has often exhibited the different preparations of colchicum in gout, and frequently with decided advantage; but very often it has failed altogether. In his own person, it has never appeared to prevent or to modify the paroxysm. In acute — and the same may be said of chronic — rheumatism, its advantages have not been by any means clearly marked in his experience; many physicians, however, testify most strongly in its favour. Like other acro-narcotics, as the cimicifuga, when pushed to the extent of slightly affecting the system, as shown by nausea, with some cerebral confusion, it has at times affected a revulsion, which has broken in upon the morbid chain in cases of acute rheumatism. Recently, a severe case of acute rheumatism, under the author's care, yielded rapidly to colchicum, pushed to the extent of inducing painful diarrhœa, accompanied by distressing tenesmus. In this case, twenty-five drops of the tincture of the seed were given three times a day. When the bowels become affected, the remedy must be discontinued altogether, or the quantity be diminished. By attending to these rules, Dr. Christison§ affirms, that he has never had occasion to observe any unpleasant effects from the use of colchicum, or any symptoms, which a dose of opium did not readily subdue. He adds, that he has never seen a case of rheumatism essentially benefited, till the patient suffered from colic and diarrhœa on the one hand, or from frontal headach and giddiness on the other. The ill success, which some practitioners have encountered in using colchicum, he thinks may have arisen from inattention to this circumstance. In chronic rheumatism, it has exhibited less marked results; yet there is no agent, perhaps, which is so much employed in rheumatic cases in general. In none of these cases, according to most observers, need any sensible evacuation be produced by it, although some, we have seen, have affirmed — and such is the result of our observation — that it is

* See, also, Dr. Lewins, in *Edinb. Med. and Surg. Journal* for April, 1837, and in *Brit and For. Med. Review*, for Oct. 1837, p. 565.

† *Memor. dell' Instituto del Regno Lombardo-Venet.* 1819.

‡ *Op. cit.* S. 143.

§ *Dispensatory*, p. 355. *Edinb.* 1842.

more efficient when it evinces its influence upon the alimentary canal.*

The vinous tincture of the seeds has been extolled in the *tetanus* of warm climates, by Dr. W. G. Smith,† of Port-au-Prince. He begins with ʒss. and increases the dose every half hour, repeating it until emesis or catharsis has been produced. The remedy is then discontinued.

In *dropsy*, colchicum was used of old with good results; and it has been employed in modern times. Carminati gives the details of a case of *dropsy supervening on scarlatina*, and Plasse, one of *hydrothorax*, in which it was advantageously prescribed. In such cases, it may be well to push the remedy until it affects the bowels.

In *chronic bronchitis*, it has been given by many physicians, and especially by Drs. Armstrong‡ and Hastings,§ with advantage; and Dr. Pereira|| found it of great service, in *humoral asthma*, and other *chronic bronchial affections*, especially when these complaints were accompanied with *anasarcous swellings*. By Ritton¶ it has been advised as an extremely efficacious remedy in *leucorrhœa*, in the dose of five grains of the powder three times a day; and in several *spasmodic diseases* it has been extolled by Raven. Mr. Tait** speaks in exalted terms of it in *scarlatina* — the dose, to children from four to six years of age, being three or four drops of the *vinum colchici* every three or four hours. Mr. Fosbroke advises it in *ischuria*; Elliotson saw favourable effects from it in obstinate *prurigo*; Bullock gave it in *erysipelas*; and by Chisholm and Baumbach†† it was exhibited successfully against *tape-worm*.

Colchicum is sometimes applied externally as a liniment to *rheumatic joints*, in the form of the tincture of the seeds or bulb.‡‡ Of late, it has been recommended by Mr. Wansborough in *gout*; §§ two drams of the tincture of the seeds being added to ʒiv. of a spirit lotion. It is affirmed, however, that the local use of morphia had the same effect, ||| — the part being bathed in

* See Wood and Bache's Dispensatory, Art. Colchicum; and Lewins, Op. citat.

† Amer. Journal of the Medical Sciences, for Nov. 1835, p. 66.

‡ Pathology of Consumptive Diseases. Lond. 1822.

§ Inflammation of the Mucous Membrane of the Lungs. Lond. 1821.

|| Elements of Materia Medica, &c. ii. p. 947, Lond. 1842; or Amer. Edit. by Dr. Carson, Philad. 1843.

¶ Lancet, Aug. 2, 1834.

** Amer. Jour. of the Medical Sciences, May, 1838, p. 205.

†† Rust's Magazin, B. xxi. S. 270; and Osann, in art. Colchicum, in Encyc. Wörterb. der Medicin. Wissenschaft. B. viii. S. 136. Berlin, 1832.

‡‡ Dict. de Matière Médic. par. MM. Mérat and De Lens, ii. 361.

§§ Lancet, July 29, 1837.

||| Ibid. Aug. 5, 1837.

hot water for a minute, and then lint being applied, spread with simple cerate, on which about three grains of acetate of morphia were distributed.

Still more recently, Mr. Laycock* has advised the tincture of the root as an external application in *rheumatism*, alone or combined with *tinctura camphoræ*. It has been used in the author's Clinique at the Philadelphia Hospital, and often with advantage; but whether much or any of the benefit was produced by the colchicum, he was unable to decide.

MODE OF ADMINISTERING.

Colchicum is not so frequently given in substance, although it is often prescribed in this form. The dose of the powdered root is from three grains to ten, several times in the day. The official preparations of this country and Great Britain are:—*acetum colchici* (United States and London); *oxymel colchici* (Dublin); *syrupus colchici* (Edinburgh); *vinum colchici radidis* (United States and London); and *extractum colchici aceticum* (London). These are made from the bulb.

The official preparations from the seeds are *tinctura colchici seminis* (United States and Dublin); and *vinum colchici seminis* (United States).† The London Pharmacopœia has, likewise, a *spiritus seminis colchici ammoniatus* or *tinctura colchici composita*, which is much used by the English physicians, and is formed by macerating two ounces and a half of bruised colchicum seeds in a pint of aromatic spirit of ammonia. Batthey recommends an *extractum colchici e succo bulborum recenter expresso*, and such a preparation is in the Pharmacopœia of Austria.‡ The dose is two grains every two hours.

Dr. A. T. Thomson recommends a *saturated vinous tincture*, made by macerating an ounce and a half of the dried bulb in twelve ounces of white wine. From thirty to sixty minims are given to gouty patients when in pain.

The dose of the powdered root or seed is, as we have said, from three to ten grains; of the *acetum colchici*, from thirty minims to one fluid dram; of the *syrupus colchici*, from one fluid dram to half a fluid ounce; of the *vinum colchici radidis*, from fifteen minims to one and a half fluid dram; and of the *vinum colchici seminis*, from one to two fluid drams.

Dr. Copland§ suggested the use of the fresh flowers in the form

* Lond. Med. Gaz. March 16, 1839, and June 8, 1839, p. 388.

† See the Author's General Therapeutics, Philad. 1836, and his General Therap. and Mat. Med. Philad. 1843; also, the Dispensatory of Messrs. Wood and Bache.

‡ Jourdan's Pharmacopée Universelle, i. 436. Paris, 1828.

§ Lond. Med. Repos. 1823.

of vinegar, tincture, &c., as milder than the seeds or bulbs, and yet equally efficacious in rheumatic and other affections; but they are not employed.

Mistura colchici.

Mixture of colchicum.

Scudamore's mixture.

R. Magnes. sulphat. ℥j. ad ℥ij.
Solve in
Aquæ menth. crisp. f.℥x.
Adde
Acet. colchic. f.℥j. ad f.℥iss.
Syrup. croc. f.℥j.
Magnes. ℥viiij. M.

To be well shaken. Three table-spoonfuls to be administered, so that from four to six evacuations may be produced in twenty-four hours. Given in paroxysms of *gout*.

Sir C. Scudamore.

Guttæ colchici compositæ.

Compound drops of colchicum.

R. Extract. aconit. ℥i. to ℥ss.
Solve in
Vin. colchic. sem. f.℥ss. M.

Fifteen, twenty, thirty, or forty drops to be given three times a day.

Weber.

R. Tinctur. colchic. sem.
—— guaiac. āā. f.℥ij. M.

Dose. — Thirty or forty drops three times a day, in *chronic rheumatism*.

Blasius.

R. Tinct. colchic. sem.
—— digit. āā. f.℥ij.
Sp. æther. nitric. ℥ss. M.

Dose. — Twenty drops, on sugar.

Hildenbrand.

*Pilulæ colchici.**Pills of colchicum.*

R. Colchic. pulv. gr. iij.
Saponis q. s. ut fiat pilula.

Dose. — Three daily, increasing the quantity to five or six.
Ritton.

*Linimentum colchici et camphoræ.**Liniment of colchicum and camphor.*

R. Tinctur. rad. colchic.
Tinct. camphoræ, aa. partes æquales. M.
Laycock.

LIII. COMPRES'SIO.

SYNONYMES. Compression, Methodical Compression.
German. Druck.

This valuable method of modifying the condition of the capillary or intermediate system of vessels, and, through it, the function of nutrition, has lately become more extensively employed in the treatment of disease. As a sorbefacient, in various *hyper-trophies* and *dropsies*, it has long been used wherever its agency was applicable, and its effects have been very decided.* Of late, it has been proposed in *inflammatory and other affections*, in which it had been previously esteemed inapplicable. Upwards of twenty years ago, it was highly recommended in *rheumatic affections*, by Dr. William Balfour,† of Edinburgh; and numerous cases were brought forward by him, and by others, to attest its efficacy. Since then, it has been advised by Guérin,‡

* Clinique Médicale de l'Hôpital Necker, p. 247, Paris, 1835; or the translation in Dunglison's American Medical Library, first year. See, also, the Author's General Therapeutics, p. 228, Philad. 1836; and his General Therap. and Mat. Med. ii. 289, Philad. 1843; likewise, Morelli, Annali Universali di Medicin. Marzo, 1840, and Brit. and For. Med. Rev. Jan. 1841, p. 237.

† A new mode of curing Rheumatism and Sprains without Debilitating. Edinb. 1817.

‡ Journ. Analyt. i. 90.

in cases of *phlegmonous erysipelas* of the extremities; by Velpeau,* in *severe burns*, and *phlebitis*, and in *inflammation of the synovial apparatus*;† and, still more recently, Mr. James Allan‡ has related three cases of *phlegmasia* benefited by a similar treatment; — two were of *erysipelas* of the lower extremities, and one of the face. In these, compression was of speedy and permanent benefit, — the pain caused by it being very transient. He states, moreover, that he has found the bandage of very great service in removing the pain and swelling of joints affected with *acute rheumatism*, after the more active degree of inflammation had passed away.

In cases of external inflammation, compression acts probably in two ways, — first, by diminishing the circulation in the intermediate system of vessels concerned in the pathological condition; and, secondly, by restoring tone to the over-dilated vessels; for it is in erysipelatous affections, in which this form of hyperæmia more especially exists, that we have found it of greatest advantage. Numerous cases of *erysipelas* of the extremities have been treated by the author by compression, and with the greatest benefit. He is constantly, also, in the habit of employing compression, under the circumstances mentioned by Mr. Allan, in *arthritic affections*, which are usually attended with great effusion, and with the most satisfactory results.

From an observation of the good effects resulting from compression in analogous cases, it occurred to Dr. Fricke,§ of Hamburg, that it might be employed with advantage in cases of *orchitis*, or swelled testicle (*hernia humoralis*); which is frequently very tedious, and requires means, that are by no means easy of application. He, accordingly, had recourse to it, and the result was most satisfactory: he found, that “the disease could be removed by it in a simple, easy, and surprisingly rapid way.” Dr. Fricke was not, however, the first to employ compression in this disease. It would seem, that as long ago as the year 1803, it was used at the Pennsylvania Hospital, by Dr. Physick, and by Dr. Hartshorne.|| Dr. Fricke is of opinion, that, generally speaking, compression may be employed in *every kind of inflammatory engorgement of the testicle*, whatever may have been its cause, and at all stages of the disease. In many cases, the pain was at first, in some degree, increased; and in some — especially when applied too tightly — it induced great suffering; but this never continued long, — the patient, in a short time, finding

* Ibid., and Bulletin Général de Thérapeutique, No. 16, Août 30, 1836.

† Nouv. Bib. Méd., Août, 1826; and Mérat and De Lens, Dict. de Mat. Méd. Art. Compression.

‡ British Annals of Medicine, Jan. 27, 1837.

§ Zeitschrift für die gesamt. Medicin. B. i. H. 1, Hamburg, 1836. See, also, Brit. and For. Med. Rev. for July, 1836, p. 253.

|| American Journal of the Med. Sciences, Jan. 1842, p. 258.

himself so much relieved as to be able to leave his bed and walk about the room. In many cases of recent origin, a single application of the compression was sufficient; but when the disease was of longer duration—say from three to eight days—it was found necessary to repeat the compression two or three times. Swelling of the spermatic cord, if not very considerable, did not contraindicate its use; nor did other coexistent local affections, as buboes, ulcers, &c. When a general febrile state accompanied the orchitis, compression was found to be the best means for removing it, where the vascular action was not too considerable; although, in extremely rare cases, such was the effect of the compression itself.

When the pain was very severe, it was generally owing to the compression having been too strong, and the same was the case with certain signs of gastric derangement, that occasionally supervened. In these cases, it was necessary to suspend the remedy, until the derangement was removed, by the use of an emetic, or the application of a poultice to the stomach. Such cases were, however, extremely infrequent.

The good effects of compression exhibited themselves very soon after its employment, and the speedy abatement of the pain was always the surest sign of its efficacy. If it continued for some hours in any considerable degree, a general disorder of the system might be looked for to explain the failure of success.

In the summer of 1835, Dr. Fricke treated, in this manner, seventeen cases. Of these were cured;—in one day, one; in three days, four; in four days, two; in five days, three; in nine days, one; and in ten days, two. The last three were severe and unfavourable cases.

For the purpose of compression, he employed sticking plaster, made very adhesive, but not of too irritating materials, and spread on strips of linen, of the breadth of the thumb. No preparatory measures, as leeches, cataplasms, &c., are required.

In slighter cases, the patient may stand before the surgeon leaning against the wall, or he may sit on the edge of a bed or sofa, in such sort that the scrotum may hang freely down. If the scrotum and neighbouring parts are much covered with hair, this must be removed; but, generally speaking, it is unnecessary.

The following is the method he adopts for applying the compression:—The surgeon takes the scrotum in one hand, and separates the diseased from the sound testicle; whilst, with the other, he gently stretches the skin of the scrotum over the former: the spermatic cord is isolated in the same manner. If the swelling of the testicle be considerable, it must be held by an assistant. The surgeon now applies the first strip over the isolated spermatic cord, about a finger's breadth above the testicle, holding

the end of the strip with his thumb, and passing it round the cord. He proceeds in the same manner with the second strip, which must cover the former either in part or altogether. The first part of the process must be carefully done; the strips must compress the cord closely; for this purpose, the cord must be kept approximated to the skin, which must be tightly stretched over it; otherwise, when the other extremity of the testicle is compressed, the upper end will be apt to slip upwards through the loose rings of adhesive plaster, which will not only occasion pain, but render the whole operation abortive. In this manner, the surgeon proceeds, applying strip after strip, the last always lying over its precursor by a third of its width, until the thickest part of the testicle — where it begins rapidly to decrease in diameter — is reached. The mode of procedure is now changed; the surgeon lays hold of the part of the testicle already covered, and passes his strips longitudinally from above downwards over the lower portion of the testicle. In this way, the rest of the testicle is closely enveloped and compressed. The proper degree of compression will be indicated, in most cases, by the speedy disappearance of the pain which had previously existed.

When both testicles are affected, they must both be included in the circular strapping — the testicle already covered serving as a point of support for the other, as there is not room enough for the application of the circular strips over the second, in the same way as over the first.

In some cases, where the skin is irritable, ulcerations take place: small slits may then be cut in the plaster, and a Goulard lotion be applied.

Generally speaking, the patient may leave his bed immediately after the strapping has been attached, and walk about the room; and, where the inflammation has not been great, he may even attend to light labour out of door.

When the strapping becomes loose, it may have to be reapplied, but often one application is sufficient.

In orchitis, caused by blows or pressure, compression is regarded by Dr. Fricke as the best agency. If the inflammation runs very high, he usually applies leeches, in the first instance, and keeps on poultices for a day or two; but, in slighter cases, he has recourse immediately to compression. The principal advantages, which he considers this mode of treating orchitis to have over others, are: *First*. The speedy removal of the pain; *Secondly*. The quick removal of the disease itself; *Thirdly*. The simplicity of the plan, and the slight trouble given thereby to the patient; *Fourthly*. Its small expense: and, *Fifthly*. The comparatively slight care and attendance required on the part of the surgeon. The last two points, as he properly remarks, are of considerable importance in hospital practice.

Since this plan of treating orchitis was suggested by Fricke, it has been successfully employed by our hospital and other surgeons, although it has been by no means extensively adopted. Several cases, too, have been mentioned by M. Déchange,* of Liège, formerly *chef de clinique chirurgicale* at the Hôpital de Bavière. Of twelve cases of acute orchitis, thus treated, three were cured in three days; and the remainder before the seventh day. Mr. Langston Parkert† has also recently extolled this remedy not only in ordinary swelled testicle, but in *chronic* or *sub-acute inflammation of the testes*, whether dependent on syphilitic causes or not; and a still more recent writer‡ affirms, that he has adopted the practice in many cases, and can speak most unequivocally in its praise. It may be employed, he remarks, in very acute forms; and he has seen several instances, where the patients had not lain in bed an hour, “whilst under the ordinary antiphlogistic treatment they would have been confined from ten days to a fortnight.”

Methodical compression has been employed with advantage in *mammary abscess*, by MM. Trousseau and Contour.§ They found it frequently to produce a cure when used at the commencement of the inflammation; to relieve the pain when supuration was established; and to be of great service after the abscess was emptied. The compression was made by means of strips of diachylon plaster, an inch broad, and several feet long, carried round the body, so as to produce regular compression of the whole breast.||

Of late, COMPRESSION OF THE ARTERIES, as an antiphlogistic agent, has been revived by Goyrand, Malapert, and others; the object being to prevent the afflux of blood to a part labouring under hyperæmia. The origin of this idea has been a matter of controversy;¶ but, as Dezeiméris** has remarked, it certainly is not due to the gentlemen who have engaged in it. Blaud compressed the carotid in *brain fever*; Autenrieth did the same, before Blaud, in cases of *convulsions*. Earl, in *epilepsy*; Livingston and Kellie, in *rheumatism*; Ludlow, in *gout*; and Parry, of Bath, half a century earlier, employed compression of the

* Bulletin Médical Belge, Août, 1838, p. 218.

† London Lancet, July 25, 1840, p. 640. See, also, J. Dixon, Lond. Lancet, Dec. 5, 1840.

‡ British and Foreign Medical Review, Oct. 1840, p. 393.

§ Journal des Connaissances Méd. Chirur. Février, 1841. See, also, J. Bell, Lond. Med. Gaz., and Dunglison's Med. Intelligencer, Dec. 1841, p. 121.

|| See, also, Littré, Journ. des Connaiss. Med. Chirur. Janvier, 1841; and Encyclogr. des Sciences Méd. Marz, 1841, p. 523.

¶ Gazette Médicale de Paris, No. 46, Nov. 18, 1837, and No. 47.

** Ibid.

vessels in different diseases, with the clearest appreciation of its *modus operandi*.

Compression of the carotids has been used by M. Ströhlín* in *hysteric convulsions*, and has almost always succeeded in modifying the form of the attack. He used it in two cases of *epilepsy* with similar success. Compression of the carotids at the commencement of the paroxysm always caused them to cease in a minute afterwards.

M. Allier† has published a case of *intermittent neuralgia* of the lobe of the right ear, cured by compression of the primitive carotid of the same side: half an hour before the paroxysm, the compression was exerted, with interruptions of five minutes every quarter of an hour. He has, also, reported a case of *neuralgia of the orbito-frontal nerve*; and, subsequently, of the *nervus pudendus superior*, respectively cured by compression of the carotid, and abdominal aorta. The compression of the carotid of the affected side was continued the whole forenoon, with pauses of five minutes every quarter of an hour. For the pudic neuralgia, the abdominal aorta was compressed for the space of three-quarters of an hour: the neuralgia, in both instances, gradually ceased.

M. Dufrèsne‡ has published a case of *hemicrania* and *facial neuralgia* of the right side, cured by the same means. Compression of the right primitive carotid for ten seconds occasioned instantaneous disappearance of the pain, which returned in one minute after the removal of the pressure. Compression of the same vessel for twelve seconds caused instantaneous disappearance of the pain, but it shifted to the posterior part of the head. This pain ceased with the removal of the pressure, and in two minutes afterwards the original pain reappeared on the right side. When graduated compression was made on the same vessel for thirty seconds, the pain, as before, moved to the posterior left part of the skull. M. Dufrèsne then pressed on the left carotid, and, increasing the force as he diminished that on the right side, the posterior pain disappeared, and no return of either had taken place ten minutes afterwards. The patient slept well, and made no complaint of pain in the morning.

Compression of the abdominal aorta has likewise been revived by M. Baudelocque, and many others, with the view of arresting *uterine hemorrhage* occurring in labour, as well as the hemorrhages which follow *wounds of the arteries of the inferior half of the body*.§ In a case of *uterine hemorrhage*, detailed by Dr.

* *Archivès Général. de Médecine*, Mars, 1841.

† *L'Experience*, No. 16, Jan. 20, 1838.

‡ *Ibid.* No. cxxviii. Dec. 1839.

§ See an account of M. Baudelocque's views, by Mr. J. C. Christophers, in *Lancet*, July 20, 1839, p. 599.

Ehrenreich,* external compression by the hand on the abdomen, which is the only way of acting on the aorta when any obstacle exists to the introduction of the hand into the uterus, was tried without success, owing to the thickness of the abdominal parietes. The hemorrhage was, however, completely controlled by introducing the entire right hand into the uterus, and making forcible pressure with the fingers in a conical shape on the aorta immediately above its bifurcation.

Many similar cases have been published, and referred to by M. Piédagnel, in a memoir communicated to the *Société Médicale d'Emulation*, of Paris, on which an excellent report was read by MM. Velpeau and Brière de Boismont, giving a history of the process. It is necessary, at times, that the compression should be continued for a considerable period, even for an hour or two, should the case seem to require it. The gentlemen, last cited, advise that it should be associated with ergot.†

Lastly : M. Allier‡ employed compression of both carotids in a case of *hydrophobia* at the commencement of an attack ; immediately, the convulsion ceased, and the patient became apparently exanimate. The family were alarmed, and would not permit a repetition of the experiment. The case ended fatally.

In paroxysmal diseases, the ratio medendi of compression is not the same as in inflammatory diseases. In the latter, the flow of blood towards the inflamed part is prevented by the compression of the arterial vessels proceeding to it ; but when compression is exerted on the vessels in neuralgia and congenerous diseases, the new impression caused by the resulting irregularity in the circulation, and the modification in the nervous function induced thereby, break in upon the morbid catenation like the different agents that are classed under the head of antispasmodics, of which class we have elsewhere endeavoured to show — what, by the way, is not now contested by any eminent therapeutist — that we have none that can be regarded in any other light than as indirect agents.§

* Medicinische Zeitung. No. xxxvii. 1839, and British and Foreign Medical Review, July, 1840, p. 279.

† La Lancette Française, May 12, 1840.

‡ Medicinische Zeitung, No. xxxvii. 1839, and British and Foreign Medical Review, July, 1840, p. 279.

§ See the Author's General Therapeutics, p. 380 ; and his General Therapeutics and Mat. Med. i. 395. Philad. 1843.

LIV. CONTRA-IRRITATIO.

SYNONYMES. Counter-irritation, Counter-action.

German. Gegenreizung.

It is not the object of the author to enter into an explanation of the therapeutical application of counter-irritants, or revellents in general; this he has done at considerable length elsewhere;* but to refer to some agents not mentioned in the body of the work, to which attention has been revived, or first directed, of late years more especially.

AMMONIATED COUNTER-IRRITANTS.

Gondret's ammoniacal ointment; Granville's counter-irritants—Antidynoust counter-irritants,—Raspail's counter-irritant.

Ammonia has long been used in different formulæ for exciting rubefaction and vesication of the cutaneous surface. When two parts of *liquid ammonia* are united with one part of *suet*, and one of *oil of sweet almonds*, the mixture forms the *Pommade ammoniacale* of Gondret, which has been used for a long time to excite a speedy revulsion in cases of *chronic affections of the brain, incipient cataract, amaurosis, &c.*, as well as to cauterise the integuments deeply.† To the advantages of this preparation, as well as of derivation in various diseases, M. Gondret has recently recalled the attention of practitioners in an *ex professo* treatise.§

The formula, given above, is that of the French Codex; but, according to M. Trousseau,|| it is much too hard for use, unless the weather is warm. He proposes two different formulæ,—

* General Therapeutics, p. 333; and General Therapeutics and Mat. Med. ii. 216. Philad. 1843.

† A term coined by Dr. Granville. It ought to be "Antodynous," from *αντι*, "against," and *δυνον*, "pain."

‡ Considerations sur l'emploi du feu en médecine, suivies de l'exposé d'un moyen epispastique propre à suppléer la cautérisation, et à remplacer l'usage des cantharides. Paris, 1819; and Nouv. Biblioth. Méd. iii. 441, 1828.

§ Traité théorique et pratique de la Derivation contre les affections les plus communes en général, telle que la Plethore, l'Inflammation, l'Hémorrhagie, &c. Paris, 1837.

|| Journ. des Connaiss. Méd. Chir., cited in Medico-Chirurgical Review, July, 1840.

one for summer, and the other for winter. In the former, he directs three parts of *lard*, one of *suet*, and four of *liquor ammoniæ*; in the latter, equal parts of *lard*, and *liquor ammoniæ*.

Since the appearance of M. Gondret's last work, Dr. Granville* has published a treatise on counter-irritation, which has given rise to much attention on both sides of the Atlantic,—partly in consequence of the strong encomiums he has passed on certain counter-irritant applications employed by him; and still more in consequence of the mystery, which he threw around them, by keeping their preparation a secret, until the united voice of the profession had expressed the mingled feelings of surprise, indignation, and regret, which such conduct on the part of an individual, holding an elevated position in the ranks of the profession, naturally engendered. It is due, however, to Dr. Granville to remark, that on subsequently publishing his formulæ, he stated, that he addressed his work to the public to impress all with the value of the agency, but that it would have been unwise in him to give precise formulæ to those who could not estimate the proper proportions of the ingredients; that every physician can apportion them; and that he had never concealed the formulæ from his friends, and always intended to give them to the world.†

Dr. Granville describes two sorts of ammoniated lotions, of different degrees of power, which are prepared in the following manner:—

Each kind of lotion consists of three ingredients:—1st. *The strongest liquor of ammonia*, A. 2d. *Distilled spirit of rosemary*, B. 3d. *Spirit of camphor*, C.

These are made as follows:—

A. THE STRONGEST LIQUOR OF AMMONIA.—Saturate a given quantity of distilled water, contained in a glass receiver surrounded by ice, with ammoniacal gas, obtained in the usual way from a mixture of equal parts of *muriate of ammonia* and recently *slacked lime*, both reduced to a fine powder. The water may be made to take up nearly 800 times its bulk of ammoniated gas under the circumstances described; its specific gravity will then be about .872, and 100 parts of it will contain thirty-three parts of real ammonia, according to Sir H. Davy's tables. This solution of ammonia will, therefore, be more than three times the strength of the *liquor ammoniæ* of the Pharmacopœia of London, 100 parts of which, at a specific gravity of .960, contain only ten parts of real ammonia. Dr. Granville, therefore, called this "*liquor ammoniæ fortissimus*." The *liquor ammo-*

* Counter-irritation, its Principles and Practice, illustrated by one hundred Cases of the most painful and important Diseases effectually cured by External Applications. London, 1838; or Dunglison's Amer. Med. Lib. edition. Philad. 1838.

† London Lancet, Oct. 27, 1838.

niæ fortior, of the last United States' Pharmacopœia (1842), which is of the specific gravity 0.882, is of sufficient strength.

B. DISTILLED SPIRIT OF ROSEMARY. — Take two pounds of the *tips* or *small leaves of fresh rosemary*, and eight pints of *alcohol*; leave the whole in infusion for twenty-four hours in a well covered vessel, and after adding as much water as will just prevent the empyreumatic smell, distil over seven pints. The Pharmacopœias of London and the United States direct the essential oil of rosemary to be distilled with alcohol to form the spirit of rosemary. Such a preparation Dr. Granville found unsuited for his purpose.

C. SPIRIT OF CAMPHOR. — To four ounces of pure *camphor* add two pints of *alcohol*, so as to dissolve the camphor, which solution should be filtered.

The three ingredients, thus prepared, every medical man should keep always ready at hand, in well-stoppered glass bottles, so as to be able to make, extemporaneously, a counter-irritating lotion of any requisite strength, according to the nature of the case. But, for ordinary purposes, Dr. Granville advises, that both a milder and a stronger ammoniated lotion should be kept ready for use.

Lotio ammoniata mitior.

Milder ammoniated lotion.

Assuming the quantity of lotion desired to be divided into *eight* parts, the proportion of the ingredients will stand thus : —

A — four-eighths. B — three-eighths. C — one-eighth, or as follows : —

R. Liq. ammon. fort. f.℥j.
Spirit. rosmarin. f.℥vj.
Tinct. camphor, f.℥ij. M.

Lotio ammoniata fortior.

Stronger ammoniated lotion.

If the quantity desired be also divided into eight parts, then the proportions of the ingredients will run as follows : —

A — five-eighths. B — two-eighths. C — one-eighth, or as follows : —

R. Liq. ammon. fort. f.℥x.
Spirit. rosmar. f.℥ss.
Tinct. camph. f.℥ij. M.

Although the changes of proportion may be deemed trifling, yet the strength of this lotion is such, that Dr. Granville never employs it, except in cases of apoplexy, and for the purpose of cauterization.

Directions in Mixing the Ingredients. — A and B are gradually mixed together. The mixture becomes opalescent and somewhat turbid, and a peculiar, highly agreeable, ethereal smell is given out, different from the individual odour of either ingredient, although the extreme pungency of the ammonia is still discernible. "I have strong reasons to believe," says Dr. Granville, "that, at this point of the operation, some particular change takes place, which imparts to the mixture of the two ingredients some of its valuable peculiarities as a counter-irritant described in my work; but what that change is, it is not my business to enter upon in this place: suffice it to say, that in a great number of experiments made with the ingredients separately, (for each of them acts as a counter-irritant on the skin,) and with them combined, the effects were uniformly different; those in the former case being found unequal to the production of those complete results which I trust I have justly promised to the profession. Ammonia alone (however strong) will not give rise to the effects I have described, though it has often stopped internal pain, and produced small blisters; but never has it succeeded in almost immediately producing a full vesication, as I have seldom failed to produce with the two ingredients mixed together, particularly after the third ingredient had been added."

Before, however, that third ingredient is so added, it is desirable to clear the previous mixture, by the addition of a small quantity of alcohol, and to set the whole in a cool place. All the various precautions here mentioned may, upon an emergency, be dispensed with, when an immediate action is required, either to arrest pain or relieve deep-seated inflammation. But for the more delicate uses, particularly for instantaneous vesication, Dr. Granville recommends, that the preparations should be obtained in the manner specified.

The lotion must always be kept in bottles with a glass stopper.

M. Raspail* has recommended the following lotion, the effects of which, he says, are often instantaneous in relieving intolerable *headach*:

- R. Liqueur ammon. p. 100
- Aquæ destillat. p. 900
- Sodii chlorid. purif. p. 20
- Camphor. p. 2.
- Essentiæ rosar. q. s.

The whole to be dissolved cold.

* L'Experience, 24 Juillet, 1840.

A piece of linen is to be steeped in this solution, and applied over the part of the head which is the seat of pain, care being taken that none of the fluid passes into the eyes.

EFFECTS ON THE ECONOMY IN HEALTH.

The various counter-irritants, described above, act essentially in the same manner ; differing only in the intensity of the counter-irritation, which they induce. In all, the liquor ammoniæ is the main effective ingredient.

The stronger of Granville's lotions is a powerful agent. It gives rise in a few minutes to vesication over the whole surface to which it may be applied ; almost as rapidly, indeed, as if boiling water were placed upon the part.

It need scarcely be said, that the strength of these lotions may be regulated so as to produce either full vesication, or simply rubefaction, by varying the quantity of the liquor ammoniæ.

The mode of applying these liquid counter-irritants is, as in the case of the *Oleum Sinapis* (q. v.), first to impregnate with them a piece of cotton or linen, folded six or seven times, or a piece of thick or coarse flannel ; and then lay either of these on the spot, pressing with the hand, at the same time, very steadily and firmly on the compress, over which there should be placed a thick towel, doubled several times, so that not only the evaporation of the lotion may be impeded, but the hand, employed in pressing the application to the part, may not suffer from direct or indirect contact with the liquid. Care must be taken that the ammonia does not reach the eyes or nose.*

As a general rule, the application should seldom be kept on longer than from one to six or eight minutes ; and, Dr. Granville affirms, it has often happened to him to find, that less than a minute was sufficient to produce the desired alleviation of pain and spasm. But in order to excite the higher degrees of counter-irritation, as vesication and cauterization, as many as ten or twelve minutes may be necessary.

EFFECTS ON THE ECONOMY IN DISEASE.

There can be no doubt, that the ammoniated counter-irritants are valuable agents in all those diseases, which are capable of being benefited by a sudden and powerful revulsion. It is chiefly, as elsewhere stated,† when the diseased action has been

* Granville, Op. cit., Amer. edit. p. 39.

† General Therapeutics, p. 341 ; and General Therapeutics and Mat. Med. ii. 221. Philad. 1843.

prolonged for a considerable period, and in affections, which belong to the *neuralgic class*, that rapid revulsions are productive of the most marked advantage. When the disease is of an acute character — as in the different phlegmasiæ — revellents, which are more prolonged in their action, are — as a general rule — preferable. It is in the first class of affections, chiefly, that his lotions are extolled by Dr. Granville ; he urges the importance of the sudden vesication effected by them in the treatment of many serious disorders ; and affirms, that they arrest “ *nervous and muscular pain* almost immediately, provided it does not depend on structural disease.”* There is perhaps no agent — he remarks — except boiling water, which can, in the space of between three and ten minutes, give rise to as ample a vesication. But, as powerful and effective a revulsion can be accomplished by the actual cautery in various forms, and especially in that of the moxa (q. v.). This we say from observation ; and it is a result to which just theory would lead us.

The ammoniated lotions are, however, devoid of the painful mental impression, which the dread of actual fire occasions ; although we doubt not that, in many of the cases above referred to, such mental impression may exert an important agency in the cure.

Dr. Granville gives the following, not very classically arranged, list of diseases, which, in the course of nine years, have appeared to him to be benefited by his counter-irritants.

DISEASES.

A. Principally affecting the Nervous System.

- | | | |
|----------------------------------|-----------------------------|--------------------|
| 1. <i>Acute neuralgia</i> | { periodical
permanent } | Tic douloureux. |
| 2. <i>Spasms</i> | { including } | Epilepsy. |
| 3. <i>Convulsions</i> | | St. Vitus's Dance. |
| | | Hysterics. |
| 4. <i>Cramp.</i> | | |
| 5. <i>Brow-ague.</i> | | |
| 6. <i>Tetanus or lock-jaw.</i> | | |
| 7. <i>Highly acute toothach.</i> | | |
| 8. <i>Nervous headach.</i> | | |

* Lancet, Oct. 27, 1838.

B. Principally affecting the Muscles and Tendinous Tissues.

9. *Rheumatism.*
10. *Lumbago.*
11. *Swelled and highly painful articulations.*

C. Principally affecting the circulation.

12. *Headach from fulness of blood in the head.*
13. *Congestions and sudden attacks of blood in the head.*
14. *Sore-throat.*
15. *Early inflammation.*

{	<i>a.</i> of the trachea, and bronchia, <i>b.</i> of the lungs and their membranes, <i>c.</i> of the heart and pericardium.	}	Tending to consump- tion
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D. Diseases of a Mixed Character.

16. *Suppressed gout.*

}	<i>a.</i> Affecting the heart. <i>b.</i> Affecting the stomach.
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17. *Genuine gout.*
18. *Paralytic debility.*

E. Accidental, Mechanical, and Cutaneous Derangements.

19. *Violent sprains.*
20. *Pimples.*
21. *Biles.*
22. *Ringworm.*

Dr. Granville does not affirm, that all these disorders, and their modifications, have yielded to the ammoniated counter-irritants; or that the counter-irritants were always the sole agents employed. On the contrary, a few of them, he says, on particular occasions, resisted that agency; others were only momentarily benefited; and a few more required the simultaneous employment of ordinary and internal remedies to assist in, and complete, the cure.

Among the exceptions to the general rule of success, he enumerates chronic tic douloureux; chronic rheumatism of long standing; epilepsy dependent on organic mischief in the brain, or any part of the spinal apparatus; and rheumatic gout, in persons whose constitutions had been completely shaken by that disorder, or by any other previous disease, although, even in this case, some good was obtained from using the ammoniated counter-

irritants. The second and fourth of these disorders are of that number which require, in addition to the ammoniated applications, an appropriate internal treatment. The other two, Dr. Granville has found to be only partially relieved, but never cured by counter-irritating lotions.*

In many of the disorders, referred to by Dr. Granville in the table given above, the ammoniated counter-irritants have been employed both in public and private in this country. They have been largely used by the author, and the effect in *nervous* and *spasmodic diseases*, in *neuralgic* and *deep-seated rheumatic pains*, has at times been very striking. Severe pains have yielded rapidly, as described by Dr. Granville; *hyperæmiæ* of particular organs have been diverted elsewhere, especially after blood-letting and sedatives had been premised; and, in short, whenever revellents, sudden and rapid in their action, have been demanded, ammoniated counter-irritants have effected every thing that similar powerful revellents were capable of accomplishing, — but no more. The author is in the habit of having recourse to the moxa in congenerous affections, and — as before remarked — with equally satisfactory results. There is one objection, too, that applies to the use of these strong lotions: — the sloughs and sores induced by them are often considerable, and remarkably difficult to heal. This, it is true, may be partly prevented, by being careful that the application is not too long continued; but, with the greatest caution, these results will, at times, supervene. When such is the case, simple dressings, with emollient poultices, will be found the best applications.

LV. CORTEX ADSTRIN'GENS BRASILIEN'SIS.

SYNONYME. Astringent Bark of Brazil.

This bark was introduced into Germany, in the year 1818, by Schimmelbusch, a merchant, who carried it from Brazil, where it had long been used internally, as well as externally, as an excellent astringent.† According to Von Martius,‡ it is the bark of *Acacia jurema*, but this is not certainly determined.§ Merrem||

* Op. cit. p. 29.

† Von Schlectendal, in *Encyclop. Wörterb. der Medicin. Wissenschaft.* B. viii. S. 538. Berlin, 1832.

‡ Reise, ii. 788.

§ Riecke, *Die neuern Arzneimittel*, S. 146.

|| Ueber den *Cortex adstringens Brasiliensis*. Köln, 1828.

affirms, that the genuine bark is in more or less flat pieces, at times in half, or complete rolls, from four to twelve inches long; from an inch to two inches and a half broad, and from one to four lines thick : these are more frequently straight than crooked. The bark may be separated into two parts, an outer, which is rough, and an inner rind of a smooth fibrous character : the two are but loosely connected together. The outer bark is of a grayish-brown colour, traversed by longitudinal and transverse furrows, having, here and there, white and grayish-white crusty growths, covered with a foliated lichen. The inner bark is of a dark red-brown on its outer surface, and after the outer bark has been separated, is somewhat smooth : on the inner side, it is of a brighter reddish-brown, and, probably owing to the laceration of the woody splinters, somewhat fibrous. The younger bark is smooth in the fracture, and of a dull splendour. The older bark, which is thicker, is unequal, and may often be separated into fibrous layers, which are readily lacerable. When chewed, it has a tolerably strong, astringent, somewhat bitter and disagreeable taste, but it does not excite nausea, or leave any *arrière-gout*. It has scarcely any smell. In its chemical relations, it resembles rhatany.*

EFFECTS ON THE ECONOMY.

Merrem, who made numerous experiments with the bark, affirms, that whilst it possesses the properties of astringents in general, and to a high degree, it is rather sedative than exciting ; agrees with the digestive organs, and aids the peristaltic action. He employed it, first, with more or less success, in *hemorrhage* — in *epistaxis*, *hæmoptysis*, and *metrorrhagia* ; and Günther found it very efficacious in *profuse menstruation* arising from atony of the uterus. Secondly ; in *mucous discharges*, as *leucorrhœa*, *blennorrhœa*, &c. Thirdly ; in *inflammatory and exanthematous affections* — as *cynanche*, *urticaria*, and in *periodical erysipelas of the face*. Fourthly ; in *nervous diseases*, especially when associated with disturbance of the menstrual function, and *leucorrhœa* : and, fifthly ; in *weakness and catarrhs of the genital organs, bladder and rectum*. The Indians consider, that the bark affects especially the generative apparatus, and, from the

* See the analysis by Hofrath Trommsdorff, in Brande's Archiv. B. xxxiii. S. 260 ; and Dierbach in Heidelberg. Annalen, B. x. H. 3. S. 357. Heidelb. 1834.

† In Harless Rhein-Westphal. Jahrbüchern, B. viii. St. 1, S. 72 ; and Brande's Archiv. Band xi. S. 200.

experiments of Merrem, it would seem, that its agency is more particularly exerted in cases of *leucorrhæa*; and in many, after the cinchona had been administered without effect.*

MODE OF ADMINISTERING.

Merrem prescribed it in various forms. He gave the powder in doses of from ℥j. to ℥ss., three or four times a day, mixed with water. It appeared to him to act most beneficially in cases of *mucous discharges unaccompanied by disorder of the digestive functions*; and he found, that the powder was better borne by some than the decoction, which is singular, as the woody matter is more apt, in such cases, to disagree. He rarely gave it combined with aromatics, and never found the combination of use. To form the DECOCTION, an ounce of the *coarsely powdered bark* was boiled with sixteen ounces of *water*, down to ℥vij.; and to this an ounce of *syrup* was added. The dose was from one to two spoonfuls every two hours. Merrem also prepared an EXTRACT, and a TINCTURE, in the same manner as these preparations are made of cinchona; of the former, he took from one to two drams, dissolved it in six ounces of an *aromatic water*, and added ℥ss. of *syrup*. Of the mixture, a spoonful was given every hour.

Externally, the decoction was injected three times a day in *leucorrhæa*, and in *blennorrhæa*; or, in the former disease, a sponge imbued with the decoction was introduced, and kept there for some time. It has been applied, also, as an astringent to *ulcers*.

Mistura corticis Brasiliensis adstringentis.

Mixture of the astringent bark of Brazil.

- ℞. Decoct. cort. adstring. Brazil. f.℥vij.
Copaib. cum vitelli ovi, q. s. subact.
Tinct. ferri pomati, āā. f.℥ij.
Syrup. balsam. f.℥j. M.

Dose. — A spoonful every two hours, in obstinate *gonorrhæa* and *leucorrhæa*. *Merrem.*

* Osann, in Encyc. Wörterbuch der Medicin. Wissensch. viii. 541.

R. Cort. adstring. Brazil. ℥ss.
 Coque cum aquæ fontan. q. s.
 Sub fin. coction. adde
 Sabin. ℥ss.
 Colaturæ, ℥viij. adde
 Syrup. aurant. cort. f.℥j.

Dose. — A spoonful every hour, in *cancer of the uterus*, and
 in the *hemorrhage* thence arising. *Merrem.*

LVI. COR'YLUS ROSTRA'TA.

SYNONYME. Beaked Hazel.

Beaked hazel is a shrub two or three feet high; NATURAL ORDER, Amentaceæ; Suborder, Cupuliferæ; SEXUAL SYSTEM, Monœcia Polyandria; which grows in the mountainous regions of North America. The nut, which it produces, is of an ovate shape, surrounded by a coriaceous and scaly involucre or cupula, terminating in a tube an inch and a half long, covered with short and thick bristles, very similar to those of mucuna or cowhage.*

EFFECTS ON THE ECONOMY.

The short, stiff, bristles have been found to possess similar anthelmintic virtues with mucuna, and to be equal to it in all respects. Mr. Duhamel states, that Dr. Heubener of Bethlehem, Pennsylvania, from whom he obtained the specimen described by him, had employed it in cases of *worms*, and was much pleased with it.

MODE OF ADMINISTERING.

It may be given, like mucuna, in syrup, melasses, or other consistent vehicle, and in the same doses.

* A. Duhamel, Amer. Journal of Pharmacy, Jan. 1843.

LVII. CREASOTUM.

SYNONYMES. Creasoton, Creosoton, Creosotum, Kreosoton, Kreosotum, Creosote, Creasote, Kreosote, Kreasote.
German. Kreosot.

This substance was first discovered, a few years ago, by Reichenbach, of Blansko, and is extensively employed as a therapeutical agent. Its marked chemical properties suggested, that it might be possessed of a decided influence on the economy, and numerous experiments were immediately instituted to test the accuracy of the notion. These were of the most opposite character; and it is not surprising, as in every similar case, that there should have been great discrepancy in the results, and in the opinions deduced therefrom. There can be no doubt, however, that creasote forms a valuable addition to the list of our remedial agents.

MODE OF PREPARING.

The process given by Koene,* is esteemed one of the best for preparing it on a large scale; — almost the only way in which it is formed: we, consequently, meet with it only in commerce. Hence it is in the *Materia Medica* list of the *Pharmacopœia* of the United States (1842), — not amongst the preparations.

Tar, derived from pit-coal, is distilled in a retort provided with a long tube, having a large mouth. Under this is placed a receiver. The oil, which comes over first, swims on water; and it is necessary to remove, from time to time, the products of the distillation, until an oil is obtained, which sinks in water. When this is the case, the product is collected. The heavy oil, obtained during the distillation, condenses not only in the receiver, but in the tube of the retort, where it unites with the naphthaline, forming a butyraceous substance. By applying a gentle heat, the mass drops into the receiver. The product is now allowed to remain in a cool place for some hours, after which it is pressed. The expressed naphthaline still contains oil, which is separated by heating it with its own weight of acetic acid, until it melts. After allowing it to cool, the crystallised naphtha is pressed, and the acid adhering to the creasote is saturated with carbonate of

* *Annales de Chimie et de Physique*, Juillet, 1835. See Cormack on Creosote, p. 36, Lond. 1836; or the Amer. edit. in Duglison's *American Medical Library*; also, Turner's *Chemistry*, 5th edit. p. 872, and Christison, *Dispensatory*, p. 374, Edinb. 1842.

potassa. The creasote is now to be shaken for a quarter of an hour with phosphoric acid, — the proportions being half an ounce of the acid to twenty ounces of the oil. The mixture ought then to be agitated with its bulk of water, and afterwards be distilled with a graduated heat, care being taken to separate the oil which floats on the surface. The rectified oil is now to be dissolved in its own volume of a hot solution of caustic potassa, s. g. 1.120. When it has been allowed to cool for half an hour, the supernatant oil is removed, and the heavy oil again treated with caustic potassa, only a fourth part of the solution being, however, employed this time. On uniting the solutions of potassa, a slight excess of diluted phosphoric acid is added, and the free creasote, which floats on the surface, is separated. It is again rectified; and the first product — which is chiefly water — being rejected, the creasote comes over pure. M. Koene recommends the substance, thus prepared, to be preserved in bottles, covered with black paper.

A protracted and complex process, like the above, necessarily makes the drug expensive, especially as the quantity obtained is but small. M. Koene procured by it ten drams from thirty-two ounces of tar. M. Lémère, one of the first Parisian pharmacians who made pure creasote, obtained from eight hundred pounds of tar about six pounds of creasote.

Reichenbach generally prepared it from the tar of the beech by six distillations; dissolving it afterwards in a solution of caustic potassa three times, setting it free successively by sulphuric acid.*

Giordanot has recommended the following simplified mode for obtaining it. Distil wood tar from the willow, at an elevated temperature, from a tinned copper retort, until the residue has the consistence of soft pitch. Re-distil the liquor passed over till its residue resembles the former. The liquor, neutralised by carbonate of potassa, or lime-water, is re-distilled till all the oil of creasote has passed over. The oil is dissolved in caustic potassa, from which, after simmering a little, in a porcelain vessel, and cooling, the eupione, which floats, is easily separated. The same operation is repeated with the eupione, to remove all the oil that is united with it. The saponaceous liquor, treated

* For an account of this and other products of the destructive distillation of vegetable matter, see Cormack, *Op. cit.* Reichenbach's observations and experiments are contained in a work entitled "*Das Kreosot in chemischer, physischer und medicinischer Beziehung*, von Dr. K. Reichenbach, u. s. w. zweite mit Nachträgen und Zusätzen von Schweigger-Seidel verm. Ausgabe. Leipz. 1835;" see, also, *Annales de Chimie*, liii. 325. Paris, 1833.

† *Annali di Medicina*, Aprile, 1835, and *Br. and For. Med. Rev.* July, 1836, p. 283. For the process of Calderini, see *Edinb. Med. and Surg. Journ.* for Oct. 1834; and for that of M. Cozzi, see *Journal de Chimie Médicale*, and *American Journal of Pharmacy*, Jan. 1839, p. 339.

with dilute sulphuric acid, is distilled into water, from which the creasote is separated, and the water saturated with creasote is kept for external use, or re-distilled for a concentrated acetic acid of a pungent and most agreeable odour.

Creasote is a colourless, transparent fluid. Its refractive power is very great, and in angular glass vessels it is beautifully iridescent. Its odour is penetrating, and disagreeable, but not offensive: many compare it to that of castor. It adheres to every thing, and is somewhat permanent. Its taste is at first very burning and caustic to the tongue; but on admixture with the saliva, it becomes somewhat sweetish. It has an oleaginous feel, and is of about the consistence of oil of almonds. Its specific gravity, at 68° Fahr., is stated by Reichenbach to be 1037; but Dr. Christison* affirms, that he has never found it lower than 1065 or higher than 1067. The fact is, of course, of interest in relation to its adulterations. It boils at 397°, and at — 17° does not congeal. When placed on paper, it forms a greasy spot, which, however, disappears after a while, and can be removed by the application of a heated body, without any residue. It is a non-conductor of electricity. With water at 68°, it unites in two different proportions; — one of the combinations consisting of 1¼ of creasote and 100 of water; the other of 10 parts of water and 100 parts of creasote. The taste of the first mixture — *creasote water* — is very burning at first, and afterwards sweetish, like that of pure creasote, but of course weaker. A drop of creasote in 10,000 parts of water produces a marked impression on the tongue, and has a smoky smell. Litmus and turmeric paper are not in the least changed by it; so that it has neither an acid nor an alkaline reaction. At both poles of the galvanic battery, it furnishes numerous and striking combinations. It does not possess the property of the ordinary empyreumatic oils, of becoming yellow and inspissated. It dissolves iodine, phosphorus, and sulphur. Acetic acid at 1.070, and alcohol, dissolve it in all proportions, and with the latter it is often adulterated.† Ether and petroleum likewise combine with it in all proportions. With potassa, it forms two or three combinations, one of which crystallises. Resins and resinous bodies either decompose creasote, or it decomposes them. With balsams, fixed and volatile oils, camphor, and the vegetable alkaloids it unites readily. It coagulates albumen, and its antiseptic property is most remarkable, whence its name, from κρεας, ‘flesh,’ and σαζω, ‘I preserve:’ — σατηρ, ‘preserver.’ Fresh meat, placed in creasote water for half an hour or an hour, and then taken out and dried, may be

* Dispensatory, p. 374, Edinb. 1842.

† Journal de Chim. Méd. and Amer. Journal of Pharmacy, July, 1841, p. 112.

exposed to the heat of the sun without undergoing putrefaction. Nay, when flesh has begun to be putrid, the process ceases after it has been washed with creasote water, and if suffered to remain immersed in it for an hour, it does not subsequently putrefy. There can be but little doubt, consequently, that creasote is the main antiseptic and conservative principle of pyroligneous acid, and of tar water. From the experiments made by Reichenbach to determine the exact components of the flesh on which the creasote acts, he arrived at the following results. It unites with the albumen and red particles of the blood in the flesh, which it coagulates, without acting on the fleshy fibre, which serves merely as the frame-work for the coagulated matters; and it is well known that dried albumen does not putrefy, but becomes hard, brittle, and transparent.

EFFECTS ON THE ECONOMY IN HEALTH.

Reichenbach has properly remarked, that the excessive burning pain in the tongue, which creasote causes, must have at once suggested it to be a poisonous substance. It was soon found, that plants, sprinkled with creasote water, died; that fish placed in it were convulsed; and that small animals, as wasps and flies, died when touched with the pure article. If a small quantity of it be spread upon the hand, and washed off a minute afterwards, the place is found to present a white appearance, but without pain or inflammation. In the course of a few days, the place becomes dry, and the cuticle desquamates. When creasote is applied to a part where the epidermis is deficient, or to a wound, instantaneously an extremely violent burning pain is experienced, which continues for eight or ten minutes; but if the part be carefully washed, it gradually ceases. The cause of this is conceived to be the property which creasote possesses of coagulating albumen; and, where blood is flowing, of arresting it. If the rapid disturbance which it excites, affects important organs, death results sooner or later according to their importance in the economy: relief, however, may be afforded by those substances that dissolve coagulated albumen, as caustic alkalies, acetic acid, &c. It is probable, however, that the poisonous properties result from its acrid character.

To appreciate the physiological effects of creasote, experiments have been undertaken by many individuals. Miguet gave a young dog, for eight days, an ounce a day of distilled water containing four drops of creasote, without any effect. When, however, he doubled the dose, nausea, languor, subsultus tendinum and tremors occurred, followed, in the course of a few days, by marked emaciation. On discontinuing the creasote, the functions

gradually resumed their pristine condition, and the animal recovered its flesh. To another dog, he gave at once two drams in half an ounce of water, and immediately thereafter great prostration of the muscular system ensued, — vertigo, fixed eyes, stupor, dyspnœa, accumulation of mucus in the air passages, spasmodic cough, discharge of large quantities of foamy saliva, with vomiting of a milky matter, although the animal had taken nothing of the kind. After two hours of suffering, the animal died of convulsions. The body was immediately opened: all the tissues, except the liver, exhaled a strong smell of creasote; and the whole of the mucous membrane of the intestinal canal was inflamed. The matters contained in the stomach coagulated when placed in contact with albumen. When heated, they yielded a thick smoke, and a marked smell of creasote. In the heart and large vessels, the blood was more firmly coagulated than usual: the lungs were gorged with blood; in the brain there was no evidence either of congestion or hemorrhage.

In another dog, into whose carotid equal portions of water and creasote were injected, death resulted with similar phenomena, but more rapidly. The precise quantity of creasote used in this experiment is not stated.

Simon, in his experiments, found that when ten drops of creasote, diluted, were injected into a vein, scarcely any effect resulted.

Reiter and Müller, who, likewise, made experiments on animals, agree with Simon as to the result of injections of creasote into the veins; no special symptoms were induced by it, but this appeared to be owing to the blood being instantaneously coagulated by it, which not only prevented the farther progress of the creasote, but also of the blood; hence no evil consequences resulted; and it is probable, as Riecke has suggested,* that the weaker the solution of creasote, within certain limits, the greater may be its effect on the mass of blood.

Cornelliani,† an Italian physician, has also instituted a series of experiments with creasote on lambs, rabbits, &c. All these animals bore small doses of creasote — however unwillingly it might be taken — without any remarkable results, and without loss of appetite. Large doses, however, immediately occasioned general torpor, sudden inclination to pass the urine, paralysis — especially of the lower extremities — with or without convulsions, and frequently the ejection of a bloody foam. When the doses were large, and it was but little diluted, death took place in a few minutes, and on examination, the inner lining of the

* Die neuern Arzneimittel, u. s. w. S. 153.

† *Giornale delle Scienze Medico-Chirurgiche*, No. 8. Febrajo, 1835; *Brit. and For. Med. Review*, p. 265, Jan. 1836, and *Journ. de Chimie Médicale*, Fév. 1836.

stomach was generally found corroded, yet not so constantly as to allow of death being ascribed to that circumstance.

It followed, farther, from his experiments, that pure creasote applied to a denuded nerve, or injected only in small quantities into a vein, may occasion death suddenly, and that the application of the creasote to extensive wounded surfaces in the same animals may be ultimately followed by fatal consequences.

Where a very large dose of creasote was administered, immediate death was produced without organic lesion.

In the trials made with it by Dr. Elliotson* he found no action produced upon the bowels; but it sometimes augmented the quantity of urine. He once saw it, in the dose of a minim three times a day, cause micturition nine times in an hour. In another case, in doses of three minims, it produced severe strangury.

According to Simon, when applied to the muscles, it destroys the surface like a caustic. Müller and Reiter, in their experiments, found, that it speedily rendered the muscular fibres of a dirty-whitish appearance, and readily lacerable. When applied to the fresh blood of the hog, it converted the colour in an instant to an ashy-gray; after which it became black and quickly coagulated. Mixed, either pure or diluted, with blood, it thickens it; the mixture assumes a brown-red colour, and is found studded with small white points, which are nothing more than coagulated albumen. On exposing the coagulum to the air, it assumes a yellowish-red colour. Reich, on the other hand, who appears to have made many experiments with creasote, both in internal and external diseases, affirms, that he has never observed any caustic effect from it; from which assertion, as Riecke has remarked,† the only inference to be deduced is, that he must always have applied it largely diluted. Frémanger likewise asserts, that when pure creasote is applied to the epidermis, it does not destroy it; but merely occasions more or less redness of the skin. When applied to a suppurating surface, it caused, instantaneously, the formation of a white pellicle, owing to its coagulating the albumen contained in the secretion from the wound. Adventitious tissues, with which it is brought in contact, are destroyed by it. When placed between the lips of a wound, it prevents healing by the first intention, by coagulating the albumen; and, consequently, it may be employed in all cases where it is desirable to prevent the growing together of parts. Frémanger, is, indeed, disposed to refer all its efficacy to the action which it exerts on albumen.

Its long continued use often occasions an inflammatory condi-

* *Medico-Chirurg. Transact.* vol. xix. Lond. 1835.

† *Op. cit.* S. 154.

tion which, as Dr. J. L. Da Luz* observes, has nothing in common with the disease for the cure of which it may have been prescribed. In a case of *porrigo favosa*, treated by it recently by the author, febrile irritation supervened, and the head was covered by an artificial eruption, which induced, however, a new action in the system of nutrition of the scalp, and after its subsidence, the *porrigo* was cured.

Dr. Cormack, of Edinburgh, has likewise instituted various experiments on the lower animals to test the physiological effects of creasote.† In three experiments, about twenty-five drops of pure creasote were injected into the venous system of dogs. All the animals died. In every case of poisoning by it, which he has observed, Dr. Cormack found the following to be the symptoms: — Its first deleterious action was a powerful one of sedation on the heart; the vital energies of that organ seeming to be instantaneously paralysed. In some instances, hurried and sonorous respiration went on for more than a minute after the heart had ceased to beat. In general, one or two convulsions, resembling the tetanic, preceded death; and, almost invariably before expiring, the animal uttered one or more shrill cries. In every instance, the atony of the heart immediately after death was very striking.

From other experiments it appears, that when creasote is injected into the arteries the deleterious effects are of a much milder character, and if the dose be not large, the animal may experience but little inconvenience; a circumstance, which proves the importance of a thorough admixture with the blood before the poisonous article reaches the heart; such admixture not taking place to the necessary extent, when the poison is injected into the veins, but being readily effected when injected into the arteries, and consequently distributed through the system of nutrition.

When taken for any length of time, the urine acquires a blackish hue, and in some cases creasote may be recognised in it.‡

EFFECTS ON THE ECONOMY IN DISEASE.

Creasote has been administered in various diseases; the following may be esteemed a summary of the chief therapeutical experiments made with it.

1. *Hemorrhage*. — The discovery of creasote happened at a

* Jornal da Sociedade das Sciencias Medicas de Lisboa, tom. v. Lisboa, 1837; reviewed in Zeitschrift für die gesammte Medicin. Oct. 1838, S. 224.

† Op. cit. p. 66.

‡ Dr. Macleod, in Med. Gaz. xvi. 599, and xvii. 653.

time, when the *Acqua Binelli* enjoyed more confidence as a styptic than it does now ; and the fancied probability, that the nostrum was indebted to creasote for its properties, gave rise to many experiments with the latter in cases of hemorrhage. One of the first, who instituted experiments with it on rabbits, was G. Simon. Not being able to obtain any striking results from the *Acqua Binelli*, he tried creasote, pure, as well as in the form of creasote water, and of an emulsion prepared with gum arabic ; and from the results of these he was led to affirm, that although creasote occasioned the coagulation of the albumen of the blood, it acted no better as a styptic than cold water. With the *Acqua Binelli* he was not able to coagulate albumen. The rapid separation of the albumen in the form of a reddish-gray coagulum under the influence of creasote, he found to be of no advantage, as the mass remained soft and pulpy ; and the wound in the vessel could not close, but was immediately opened by the stream of blood. Neither did he esteem it adapted for arresting trifling hemorrhages ; for, when very much diluted, it is still too exciting to the injured parts, and markedly delays their union. This, indeed, might, he thinks, be expected from the fact, that pure creasote, when placed on the skin for ten or twenty minutes, induces superficial inflammation.

The experiments of other physicians have been decidedly more favourable. Müller and Reiter,* for example, in theirs, found that creasote was far more efficacious than the *Acqua Binelli*, for, when the latter was prescribed, it was always necessary to have recourse to other agents, before the hemorrhage was arrested. In their experiments on dogs, they found the hemorrhage from a divided crural vein quickly cease, when a compress of cotton, wetted with creasote, was placed on the vessel, with a moderate degree of pressure. Three days afterwards, the crural artery was exposed on the same dog, and divided ; but it was afterwards necessary to tie it, as the creasote, in consequence of the excessive hemorrhage, could not be brought into immediate contact with the vessel, but merely acted on the superficial layer of blood, and therefore did not arrest the hemorrhage.

The crural artery of a young and tolerably strong dog was cut a short distance above its division, compression being at the same time exerted upon the trunk. The artery did not bleed. Nine minutes afterwards, a compress of cotton soaked in creasote was applied immediately to the divided extremity of the artery, with some degree of pressure. When the compress was re-

* Schmidt's Jahrbuch, cited in Encyclographie des Sciences Médicales, Mars, 1837. See, also, Burdach, Medicin. Zeitung. Jahrgang, 1840, No. 31, cited in Lond. and Edinb. Monthly Journal of Med. Science, May, 1842.

moved, the bleeding was entirely arrested, and the wounded surface was dry, and had an ashy-gray hue. In an old dog, hemorrhage from a divided crural artery was arrested by the same means, but not so speedily. When the artery was examined, it was found to be wholly closed, having a navel-like depression at the extremity, which disappeared when the vessel was pressed upon, and ultimately became conical. Within the vessel there was a conical coagulum, which could be readily detached; and for the space of a line, the artery appeared inflamed through its coats.

In arteries that had been divided for a longer time, the union was likewise complete; but there was this difference, that the inflammation at the end of the vessel had disappeared, and a pointed fibrous caruncle was observed in the vessel, which was doubtless the fibrinous portion of the previous coagulum.

From their experiments, Müller and Reiter were led to confirm the hæmastatic properties of creasote, both when the hemorrhage occurs from veins and from arteries. The arteries divided were of considerable size, larger than the radial artery of an adult male. They consider pressure indispensable to occasion the creasote to act immediately on the artery; and the arrest of the hemorrhage, they ascribe, not alone to the coagulation of the blood, but to the contraction of the arteries. In parenchymatous hemorrhage, creasote water was generally sufficient; as well as in tolerably extensive wounds of the surface.

Höring, also, obtained satisfactory results from his experiments on animals. He exposed, on an old cat, the crural artery and vein of the right side; made a small incision into the latter, and pressed upon it to stop the copious flow which ensued: he then applied over the wound, for two minutes, a small compress of lint, wetted with a solution of creasote — two drops to one hundred of water — and the bleeding ceased. The artery was now opened, and a similar compress placed upon it with the same result. Two days afterwards, a second experiment was made of the same kind, except that, owing to the struggles of the animal, a larger opening was made into the crural artery. In this case, it was necessary to apply the compress for four minutes before the hemorrhage ceased. In another cat, a large transverse incision was made on the inner surface of the right thigh, above the middle, by which muscles, arteries, veins, and nerves were divided. Two large compresses of lint, wetted with a solution of creasote, were then pressed on the parts for five minutes, and the bleeding entirely ceased. The like result was obtained in the case of an old horse, whose jugular vein was opened. But the creasote solution did not succeed in wholly arresting the hemorrhage in the same horse, when an opening was made into the crural vein and artery.

To these experiments on animals may be added some that were instituted on the human subject, and which testify, more or less, to the efficacy of creasote as a hæmastatic. Hahn applied it in some insignificant cases, but saw no better effect from it than from cold water. Most found it speedily arrest slight hæmorrhage from small vessels. Höring applied it successfully in cases of *epistaxis*, which had obstinately resisted other agents, — two plugs of lint, dipped in a solution of creasote being inserted in the nostrils, after which the hæmorrhage soon ceased. Fichtdauer employed it with equally advantageous results in *violent bleeding from leech bites*, after several hæmastatics had been used in vain; and Heyfelder extols it for arresting *hæmorrhage from large wounded surfaces*.

Berthelot differs with Frémanger and Simon, who affirm that union by the first intention is prevented by it. The results of his observation were entirely opposite. Miguet applied it successfully as a hæmastatic in fresh wounds on man and animals. Both pure creasote and a solution of it were, however, unsuccessfully used by Bardili in *hæmorrhage from the arteria tibialis postica*, which he ascribed to the blood having lost its albumen, owing to the excessive discharge. Reich and Hauff found injections with creasote water very useful in *hæmorrhagia uteri*. Schneider had a case of *hæmorrhage* that had continued for seven hours in a man eighty years old, and which proceeded *from the gums of the upper jaw*; the blood oozing as from the pores of a sponge. He directed the man to take as much creasote water into his mouth as he was able; and after three repetitions the hæmorrhage ceased, and did not recur.

Köhler* endeavoured to test the hæmastatic operation upon himself. He made an incision in his forearm an inch long, and three or four lines deep, to which he applied creasote water. A lancinating pain was felt in the wound, but no other sensible effect. A drop of pure creasote was now let fall between the lips of the wound: this was followed by a sensation of burning and drawing; for a moment coagulated flakes of a whitish-gray colour covered the wound, and there was a temporary cessation to the flow: it soon, however, recurred. After a time the hæmorrhage ceased; but not sooner — Köhler thinks — than if cold water had been applied. The feeling of burning and drawing continued, however, for some time; the edges of the wound were somewhat swollen, and œdematous, and, in about four hours, were covered with a yellowish-brown lymph; but there seemed to be no delay in the cicatrisation.

In a case of *lithotomy*, it was found impossible to arrest the

* Neue wissenschaftlich. Annalen, u. s. w. B. i. H. 3. S. 285. Berlin, 1835.

hemorrhage by any of the usual means, and no particular vessel could be discovered from which the blood flowed. The patient was at last reduced to the lowest ebb, from the continued loss of blood, and had already lost consciousness, when a sponge, dipped in pure creasote, was introduced into the wound, and pressed against the bleeding parts for an instant or two. The hemorrhage was immediately arrested. No particular pain was experienced; no unpleasant symptoms occurred; thin eschars were thrown off, and the patient recovered.*

J. L. da Luz† found it an excellent styptic in *capillary hemorrhage*; but in *hemorrhage from great vessels* it did not prevent a recurrence of the bleeding.

In *hæmoptysis*, the internal use of creasote has been found beneficial. Santini‡ prescribed it in a desperate case with complete success, and with Schmalz it was equally effective; on the other hand, it was of little avail in Guitti's hands.

In *hæmatemesis*, it succeeded in the hands of Dr. Isaac Parrish of Philadelphia,§ after the remedies generally employed in such cases had failed to produce any effect.

2. *Burns*.—Most used creasote with decided relief in burns of the second and third degree, applied by means of rags wetted with creasote water. Berthelot also cured two cases quickly with it; the slightly burnt places becoming desiccated; the more severe healing by the formation of a crust. Guitti applied both creasote water and creasote ointment with advantage in burns which had proceeded to profuse suppuration; hence, it has been advised,—

3. In *profuse suppuration*, on the authority of Levrat and Berthelot, but according to J. L. da Luz,|| it has no marked influence on the secretion of pus, and is therefore useless in suppurating abscesses. In *otorrhœa* it has been especially beneficial.

4. *Lesions of the integuments*.—According to Reichenbach, creasote is of essential service in the *intertrigo* of children, as well as in the *excoriation induced by lying*. In the latter case, Guitti used it with success. Hahn also frequently employed it. In cases where ulceration had not taken place, he washed the parts several times a day with creasote water, and was of opinion that he had prevented, in some cases, the occurrence of ulceration. Where ulceration had already taken place, he covered the parts with linen rags, folded two or three times, which he soaked in creasote water, and fixed them on by means of ad-

* Dr. Daser, Edinb. Medical and Surgical Journal, Oct. 1841.

† Op. cit.

‡ Gazzetta Therapeutica di Verona, Mars, 1834; and Amer. Journal of the Med. Sciences, Feb. 1836, p. 502.

§ Medical Examiner, Aug. 10, 1839, p. 501.

|| Op. cit.

hesive straps. The superficial ulcers soon healed; and the deeper were transformed into hollow surfaces, secreting a homogeneous serous fluid, but no pus.

Höring employed creasote water with advantage in *sore nipples*; and creasote ointment has been recommended by Dr. Fife,* in *sprains* and *contusions*.

5. In *chilblains*, whether ulcerated or not, Hahn† used creasote washes successfully; — the affection yielding in a few days; and Dr. Herndon‡ regards creasote ointment as the best remedy in that affection with which he is acquainted.

6. *Ulcers*. — *Fissures of the skin* and *superficial ulcers*, according to Hahn, were changed, under the application of creasote water, into a blackish-brown scab, which adhered for a long time, and when it fell off, left the parts healed; or by occasioning too much shrinking, gave rise to fresh inflammation and suppuration. Deeper ulcers were affected in the same manner as those caused by long lying.

The efficacy of this agent in *atonic* and *varicose ulcers*, especially of the leg, has been attested by Levrat, Berthelot, Rossi, Hechenberger, and others; but Guitti, Heyfelder, and Schmalz were less satisfied with it. A case of *indolent ulcer* between the knee and ankle, accompanied with a good deal of inflammation, was cured by Dr. Crary, in five weeks, by the application of a solution of creasote (ten drops to the ounce of water), with methodical compression to the limb, by means of a bandage.§ Meister found the application of creasote water, in cases of *carious*, *scrophulous*, *syphilitic*, *fistulous*, and *sanious* ulcers, to be strikingly, and almost uniformly advantageous. Heyfelder, likewise, found it extraordinarily useful in *scrophulous ulcers*, and Dr. Cormack|| states, that he had an opportunity of seeing a case of the kind treated by Dr. Shortt, in the Royal Infirmary of Edinburgh, where an *extensive scrophulous ulcer of the hip*, after resisting a variety of treatment, at last yielded to creasote, and was ultimately completely cicatrised. On the other hand, Otto tried both pure creasote and the watery solution in ulcers of various kinds, especially the *scrophulous*: the ulcers very generally put on, in the course of twenty-four hours, a cleaner appearance; still they did not cicatrise, on which account Otto prefers, in old ulcerations at least, the use of a solution of chlorinated lime; for notwithstanding creasote diminished and improved the character of the suppuration from *scrophulous ulcers*,

* Lond. Med. Gaz., April 7, 1838, p. 66.

† Gazette Médicale de Paris, Dec. 1834.

‡ American Med. Intelligencer, for March 15, 1838, p. 425.

§ Boston Medical and Surgical Journal, July 3, 1839, p. 332.

|| Op. cit. p. 106.

and rendered them cleaner, it did not ameliorate the general condition; — after the diminution of the suppuration, local pains, loss of sleep, and slight febrile movements generally supervening. On these accounts, Otto does not think creasote applicable to scrophulous ulcers in general.

Many observers depose to the good effects of creasote in *scrophulous caries*. Among these may be mentioned Hahn, Coster, Ritgen, Frémanger and Hauff. In *fistulous ulcers* — also of syphilitic origin — several physicians have employed it beneficially. Dr. Fife,* of Newcastle-upon-Tyne, found it useful not merely in obstinate but in *malignant ulcers*. In no case of ulceration, he affirms, in which he tried it, did it disappoint his expectations. In a *sloughing carbuncle*, the alcoholic solution, (thirty drops to the ounce,) mixed with carrot poultices, was applied with advantage by Dr. Herndon,† of Culpeper C. H., Virginia.

In *scurvy* and in *scorbutic ulcers*, M. Coen‡ found its use followed by excellent results, and he refers to cases in which it has been administered internally with very great advantage.

J. L. da Luz§ considers it an excellent cleansing remedy in *atonic ulcers*, but its prolonged use, he thinks, retards cicatrization. In *hospital gangrene*, he esteems it the best antiseptic, and the most powerful means for checking its terrific progress.

In *gangrenous or sloughing ulcers*, Hahn used it. Several times a day he penciled the slough with pure creasote, and, in the intervals, fomented it with creasote water. According to Reichenbach, two *offensive affections of the labia pudendi* — the consequences of infiltration of blood — were cured by it; and Reich and Sir Francis Smith|| treated with success cases of *cancrum oris*, and the former, one of *scorbutic ulceration of the gums*.

In *herpetic ulcers*, Höring and Berthelot observed favourable effects from creasote water; and it has been found especially useful in *carcinomatous* and *syphilitic ulcers*, in which it has been often employed.

In *cancer of the uterus*, Wolff injected creasote water, in two cases, into the vagina. In one, the pain was so great, that, on the ninth day, after six pints of creasote water had been used, it was obliged to be discontinued. In the other case, the treatment was continued twenty-six days, and sixteen pints were used: in it, also, the pain was sensibly aggravated. The secretion was

* Lond. Med. Gaz., April 7, 1838, p. 65.

† Duglison's Amer. Med. Intelligencer, March 15, 1838, p. 425.

‡ Giornale per servire, &c. di Venezia, 1836.

§ Jornal da Sociedade das Sciencias de Lisboa, T. v. Lisboa, 1837; noticed in Zeitschrift für die gesammte Medicin. Oct. 1838, S. 224.

|| Dublin Journal of Med. Science, for May, 1837.

not improved in either case ; nor was hemorrhage prevented by it ; for one of the patients died immediately after an attack of this kind : the other lingered a long time.

Heyfelder found injections of creasote water, in conjunction with the extractum calendulæ, of no use in cancer uteri. On the other hand, in a case of superficial ulceration of the os uteri, with copious discharge of a puriform mucus, which had been treated unsuccessfully by other agents, for several months, Hahn found an injection of creasote water effectual in fourteen days. Téalier* has likewise given a case of superficial ulcerations around the os uteri, to which nitrate of silver had been applied at least twenty times without inducing a cure. By touching the ulcers with lint fixed upon the end of a probe, and dipped in a mixture of one part of creasote and three parts of water, excessive pain was induced ; but this gradually passed away, and in six days the signs of ulceration had disappeared. It is more than doubtful, however, whether either of the two last cases was carcinomatous.

In a case of *cancer of the breast*, a solution of creasote was applied by the same gentleman. This excited, instantaneously, violent pain, but after a time the pain ceased, and relief was obtained.

Rossi saw a *cancerous ulcer of the face* healed by creasote ointment, but it soon broke out again. The same gentleman cured a *fungous tumour* on the alveolar margin of the right os maxillare — which had occasioned the loss of all the teeth of that side except one, and which even the actual cautery had not prevented from returning — by a collutory of six drops of creasote in six ounces of water.

Heyfelder saw creasote used without effect in a case of *cancer of the skin*, and Cormack† in one of *lupus of the nose*. On the other hand, Guitti cured an *ulcer, in appearance cancerous*, by the application of pure creasote, for which, at a later period, the solution was substituted, and Marchal has published a case of *cancer of the lip* in which he believes he accomplished a cure by means of creasote.‡

Garbiglietti cured a *fungous ulcer with caries of the fibula* by creasote, but it is questionable whether the ulcer was carcinomatous ; and Meisinger saw a *cancer of the face* improved by the use of creasote ointment.

It has been before remarked, that Meisinger used creasote with advantage in *syphilitic ulcers*. Hahn also applied creasote water in *primary syphilitic sores* ; the small, superficial ulcers

* Revue Médicale, Février, 1834. For similar cases, see Dr. Friese, in Berlin. Medicin. Zeitung, Nro. 13, 1837.

† Op. cit. p. 115.

‡ Gazette Médicale de Paris, Fév. 1835.

healed soon, the larger and deeper remained stationary. In a *phagedic ulcerated bubo*, the spreading was arrested, but this was all. According to Heyfelder, creasote — probably the pure — excited, in a case of *primary syphilitic ulcer*, in a plethoric individual, violent inflammation, and so much sensibility, that it was obliged to be discontinued. Berthelot cured a *chancre*, which had resisted caustics and other cicatrising agencies, in a few days, by creasote water. Rehfeld, also, treated *secondary syphilitic ulcers* successfully with it, giving, however, at the same time, the corrosive chloride of mercury inwardly. *Chronic venereal ulcers* have in some cases yielded to it, after they had resisted every other kind of treatment.* Dr. Bürkner, of Breslau,† reports a case, which, after having proved rebellious to every kind of general and local management that could be devised, at length yielded to the application of pure creasote by means of a camel's hair brush. The character of the secreted pus immediately improved; the wound began to heal by granulations from the base; and, at the end of four weeks, Dr. Bürkner found his patient quite well. In *condylomata*, it has been equally successful. By the application of creasote water, Hahn found them contract and disappear; but the more obstinate required to be penciled with pure creasote. Heyfelder, Reich,‡ Fricke, and Coen,§ also found creasote efficacious in these cases. The last gentleman but one had the most frequent opportunities for observation; by him creasote, in a dilute state, was applied to the top of the condyloma by means of a pencil. In cases of small condylomata, touching them once or twice was sufficient for their removal; of larger, it had to be more frequently repeated. In some obstinate cases, it required two or three weeks before they disappeared; but when once they fell off, they did not return.

7. *Gonorrhœa, and Fluor albus*. — Most extols creasote water as a remedy in *gleet*. He applies it either in the way of injection, or by small tents wetted with it and introduced into the urethra. In *fluor albus*, he strongly recommends both its internal and external use. Reich injected creasote water in a case of *gonorrhœa*, and in one of *malignant fluor albus*; yet its agency in these cases was doubtful, as copaiba was given at the same time. Hahn,§ also, used injections of creasote water in the second stage of *gonorrhœa* and in *gleet*; but he did not think

* Cormack, Op. citat. p. 107; and in Lond. and Edinb. Monthly Journ. of Med. Science, Oct. 1842. See, also, Küncchel, in Bulletin Génér. de Thérapeutique, p. 313. Paris, 1833.

† Casper's Wochenschrift, Sepr. 9, 1837, S. 583.

‡ Hufeland's Journal, Jan. 1834, and Revue Médicale, Mai, 1834.

§ Giornale per servire a progressi della patologia, &c. di Venezia, An. 1836.

|| Gazette Médicale de Paris, Dec. 1831.

that the discharge ceased sooner under its agency than under the ordinary means; whilst in some cases, the inflammation was even augmented. In two cases of *benign fluor albus*, after many other remedies had been employed in vain, Schmalz saw good effects from the use of a solution of creasote; but in a third case it afforded no relief. Dr. Elliotson* gave it internally to a female labouring under *gonorrhœa*, at first, in the dose of two minims to an ounce of water, and afterwards in the dose of four, six, and even eight minims, but no good resulted from it.

The author has administered it not unfrequently in *leucorrhœa* and *other mucous discharges*, and when persevered in, it has at times appeared to be of decided service.†

Dr. Robert Dick,‡ of Glasgow, has called the attention of the profession to its use in the *chronic stage of gonorrhœa*, and in *gleet*. He thinks its beneficial effects are more obvious than those of copaiba. He administered it in doses of two drops with loaf sugar beaten into a syrup with water.

8. *Chronic cutaneous affections*.—Reich treated a case of *crusta lactea* externally by creasote, and internally by the mild chloride and the black sulphuret of mercury. The result was favourable. In *itch*, it was recommended by its discoverer. Wolff, too, saw three cases of not very recent itch, cured in eight days by lotions of creasote water. Reich and Coen§ extol the water and the ointment in inveterate itch. J. L. Da Luz|| considers it as valuable as sulphur, but Otto did not find the water particularly efficacious. He gives strong testimony, however, in its favour, in *herpetic eruptions*: in a very short time, it induced evident improvement, and often removed the affection in from eight to fourteen days. When the cases were more chronic, a longer time was of course required for the cure. He never administered it, however, without attaining his object. His rule was, to bathe the affected parts twice a day with creasote water, and in particular cases he directed, in addition, general baths of warm water. The eruption commonly disappeared very rapidly under this management, but it speedily recurred unless general bathing was used at the same time. It again yielded, however, very readily to creasote water. Grandjean, Reich, and Köhler, also employed the water successfully in herpes; and Guitti found both the water and the ointment most serviceable in herpetic affections when combined with appropriate internal treatment. Heyfelder recommends that alterative drinks, as the decoctum

* Lancet, for Dec. 1835, p. 435.

† See, also, Coen, in *Giornale per servire, &c. di Venezia*, 1836.

‡ Edinb. Med. and Surg. Journ. Apl. 1838, p. 602.

§ Op. cit.

|| Jornal da Sociedade das Sciencas Medicas de Lisboa, tom. v. Lisboa, 1837, noticed in *Zeitschrift für die gesammte Medicin*. Oct. 1838, S. 224.

sarsaparillæ, should be combined with them. Even in herpes exedens, the external application of creasote was found effectual by Ritgen, Grandjean, and Rossi. Wolff* cured a case of *ancient impetigo* in about eight weeks, by a solution of creasote (*Creasot.* 3ss.; *Aq. destillat.* f.3v.). At first, the application caused so much heat and inflammation, that in eight days it was obliged to be discontinued, and afterwards it was alternated with fomentations of warm water from day to day until the cure was completed. Dr. Herndon, of Culpeper C. H., Va., derived much benefit from the ointment in *psoriasis*.

In a case of *acne rosacea* of seven years' standing, accompanied with headach, nervousness, thirst in the morning and acid eructations, for which the patient — a female — was put under treatment for a month, without success, Dr. Elliotson† determined on trying creasote. The advantage was soon manifest, as in three days the eruption was evidently diminished. At first, she took two minims three times a day; this was gradually augmented to twenty minims, — the farther increase of the dose being prevented by the supervention of giddiness and tremors. At the end of seven months, she was discharged; the eruption being scarcely perceptible, and the dyspeptic symptoms entirely removed. In a *chronic pustular disease*, not curable by antiphlogistics, the same gentleman observed better effects than from any remedy previously prescribed.‡ Dr. Copland, it is affirmed, found a saturated solution in water answer well as a lotion in *porrigo favosa*.§ The author has often used in *porrigo* both creasote water and creasote ointment (see the formulæ at the end of the article); they have always appeared to him sufficiently strong, and when the quantity of creasote was increased, so much inflammatory irritation was induced, that they had to be discontinued for a time.

9. In cases of *chronic inflammation of the free edge of the eyelids*, cures were effected by Coster, and Mr. G. T. Black;|| by the former from the use, twice a day, of a dilute solution of creasote (*Creasot.* gtt. xij.; *Aq. destillat.* f.3ij.) applied by means of a camel's hair pencil. The cure was effected in ten days. The formula for the lotion used by Mr. Black is given afterwards. An ointment of creasote has also been found of essential service in various forms of strumous ophthalmia by Dr. C. C. Hildreth, of Zanesville, Ohio.¶ In different kinds of *ophthalmia*,

* Medicin. Zeitung, u. s. w. No. 30, 1834.

† Lancet, July 4, 1834, p. 459.

‡ Medico-Chirurg. Transact. xix. 237. Lond. 1835.

§ Gully's Edition of Magendie's Formulary, p. 204. Lond. 1835. See, also, Sir F. Smith, in Dublin Med. Jour. for May, 1837, and J. L. Da Luz, Op. cit.

|| London Lancet, Aug. 7, 1841.

¶ American Journal of the Medical Sciences, Oct. 1842, p. 364.

M. Sanson used creasote, but never observed the disease to be modified by the treatment.*

10. In a case of *prolapsus vaginæ*, Schlesier tried the external use of a solution of creasote. After astringent injections, and the application of the decoctum *Kramerie* by means of a sponge, had been used in vain, he injected diluted creasote for seven weeks, omitting it only at the time of menstruation. It excited a burning sensation of a few minutes' duration. At the expiration of the time mentioned, the prolapsus had strikingly diminished, and the great sensibility of the prolapsed parts had disappeared. Owing, however, to the supervention of irritation in the urinary bladder, it had to be discontinued, when there was every prospect of ultimate success.

11. Dr. Buttmann,† of Vietz, circle of Landsberg, has given the case of an old lady, upwards of seventy years of age, who had laboured for several years under *œdema* of both legs to such an extent as to interfere materially with progression. She experienced lancinating pains in both feet, and irregular paroxysms of fever. Many external and internal remedies had been used in vain, when Dr. Buttmann, by way of experiment, applied cataplasms of creasote, soon after which the swelling, very much to his astonishment, gradually disappeared, and with it the febrile attacks.

12. In *toothach* from carious teeth, creasote has often been used, being applied to the hollow of the tooth by means of a pencil, or of cotton imbued with it. The testimony in its favour has been very great,—Coster, Reich, Hahn, Kneisel, Heyfelder, Fichtbauer, Hauff, Otto, Guitti, Köhler, Meisinger,‡ and numerous others. Some have advised a collutory of creasote, but this is more disagreeable, whilst it is less efficacious than creasote applied immediately to the carious tooth. It excites instantaneously acute pain and a considerable secretion of saliva. The pain is often relieved by it, but it generally recurs; and perhaps the advantage derived from this agent is not greater than from the stronger essential oils. As a palliative, it is very useful. In *rheumatic toothach*, the insertion of a little cotton, imbued with creasote, in the ear of the same side, has been found serviceable.§

Although, however, it alleviates the pain of toothach, it has been considered to hasten the destruction of the tooth.||

* *Compte rendu des Séances de la Société de Médecine, Séance du 7 Mars, 1834.*

† *Beiträgen zum Sanitäts-Berichte des Frankfurter Regierungs-Bezirks: and Medicinische Zeitung, Dec. 7, 1836, S. 252.*

‡ *Medicin. Jahrbüch. des k. k. österreich. Staates, B. xv. S. 553. Wien, 1834.*

§ *Riecke, Op. cit. S. 167.*

|| *Cormack, Lond. and Edinb. Monthly Journ. of Med. Oct. 1842.*

13. In *deafness*, apparently owing to a deficient secretion from the ceruminous follicles, advantage has been found from the use of creasote, after the ear had been syringed. Perhaps as good a form as any is that recommended by Mr. Curtis,* which consists of one dram of creasote to four drams of lard. A little of this oil is inserted into the meatus night and morning, with a camel's hair pencil. He considers the preparation contra-indicated in cases of *otorrhœa*, where there is any pain or inflammation. Dr. Partridge,† who has seen many excellent effects from creasote in such cases, prefers to commence with half a dram of creasote to four drams of oil of almonds, applied by means of a camel's hair brush. After a few days, he usually increases the quantity of creasote as occasion may require, often using it as strong as one part of creasote to three of the oil.

So far we have spoken mainly of the external use of creasote. Reference has been made to its internal administration in cases of *hæmoptysis*, *hæmatemesis* and *fluor albus* only. In the following diseases, it has been chiefly given internally : —

14. *Phthisis*. — Reichenbach excited considerable expectations from the use of creasote in *phthisis*, — *pulmonary*, *laryngeal*, and *bronchial*; and as in so intractable a disease every suggestion is immediately and eagerly embraced, numerous trials were instituted with it, the results of which were by no means accordant. Reich‡ affirmed, that he gave it both in laryngeal and tubercular phthisis with distinguished success. In a case, in which the disease appeared to be considerably advanced, the offensive expectoration was changed into one of a tasteless, mucous character, although the fever and the night sweats experienced no modification. Subsequently, hæmoptysis supervened, with violent fever; on which account the dose of creasote was diminished. Under the use of the remedy the condition of the patient appeared to improve, — except the cough, which was not mitigated; an anodyne was consequently substituted for the creasote; under which, his patient — a female — improved so much, that Reich was led to believe she might be saved, although the cough still remained severe and frequent. In another case, creasote allayed the hectic fever, and transformed the purulent expectoration into one of a mucous character; yet, although the general condition of the patient seemed to be improved, the cough and uneasiness of the chest continued almost unchanged. Grandjean, also, had a case of phthisis in the third stage, the expectoration of which was soon diminished; the pain in the

* London Lancet, vol. i. p. 328, 1838-9; and Mr. Wright, *ibid.* p. 580.

† Medical Examiner, May 30, 1840, p. 348.

‡ Hufeland's Journal, Jan. 1834; and Revue Médicale, Mai, 1834.

side removed; the appetite, sleep, and strength restored, under the administration of creasote; but the result of the case is not known. Levrat asserts, that he found it highly useful in chronic bronchitis, and in some kinds of phthisis. Hechenberger saw good effects from the inhalation of creasote in the form of vapour in a case of ulcerated lungs; five, ten, or fifteen drops, according to the degree of tolerance of the lungs, being dropped into hot water in an appropriate vessel, and the vapour received through the tube of an inverted funnel. Hechenberger was of opinion, that this mode of exhibiting creasote prevented the disagreeable effects apt to be induced by its internal use; and farther experiments have confirmed his view. In the chronic mucous affections of the lungs of old people, it appears to have been especially useful. On the other hand, Elliotson* derived no favourable results from his trials with creasote in phthisis; even inhalation of the vapour was generally unattended with any advantage; yet, he is of opinion, that it may be useful where there are only one or two ulcers in the lungs, and there is no tendency to their farther production, as well as where there is much secretion from the bronchial mucous membrane. Either no advantage, or an injurious influence was derived from its use in phthisis, by Rehfeld, Haupt, Treumann, Günther, Schmalz, Meisinger, Otto, Köhler,† and others.

The published experiments by Wolff, in the Charité at Berlin, cannot be esteemed more favourable. It was tried in eleven cases of tubercular phthisis, of which one was in the first, eight were in the second, and two in the third stage. In two cases, there was scarcely any advantage after the remedy had been given for fourteen days. In one case, it had to be discontinued on the eleventh day, owing to the supervention of obstinate vomiting. The case ultimately terminated unfavourably. In six cases, the symptoms appeared to be aggravated, and the patients died soon afterwards. In two cases, in which the disease was in its second stage, death supervened unexpectedly early, on the fourth, and the seventh day of the treatment, — in one case by suffocation; in the other, by sudden hydrothorax. The pulse, according to Wolff, was generally quickened under its use; the hectic augmented; the urinary secretion diminished; the expectoration neither changed in quantity nor quality; the cough not mitigated; nor the dyspnoea diminished: on the other hand, in four cases, they were manifestly increased: once, epistaxis occurred, and twice, hæmoptysis.

From the results of all his trials, Wolff is disposed to think, that creasote should be banished from our list of agents em-

* *Medico-Chirurg. Transact.* xix. 221; Lond. 1835.

† *Hecker's neuen wissenschaft. Annal.* B. i. H. 3.

ployed in phthisis ; both as respects the radical and the palliative treatment ;* but although they may not sanction us in placing much value on creasote in the treatment of phthisis, it may be improper to ostracise it altogether,† as, according to the testimony of others, it would seem to have rendered service. Rampold and Späth assert, that they have derived advantage from it in confirmed phthisis where no inflammatory complication was present ; the expectoration and colliquative sweats being diminished under its use.

M. Pétrequin,‡ from his trials with it, considered its effects to be more beneficial — as might be presumed — in incipient than in confirmed phthisis ; but in no case did he observe anything approaching the radical cures described by some. He indeed gives the preference to tar water (see *AQUA PICEA*, p. 59).

15. In *bronchorrhœa*, or that state of the bronchial mucous membrane which consists in a profuse secretion without inflammation, the inhalation of creasote has been found of essential service.§

16. *Rheumatism and Gout*. — The success, obtained by Reich|| from tincture of soot in gouty and rheumatic affections, and the probability that the efficacy might depend chiefly on the creasote it contained, induced him to prescribe the latter remedy internally in those diseases. He made the first trial upon himself. After exposure to cold, he was attacked with lancinating pain in the whole of the right leg, for the removal of which the ordinary remedies were employed in vain : it yielded to the use of creasote given for nine days. He relates another case of rheumatism and one of atonic gout, in which creasote was equally successful. Marcus, of Hadersleben, recommends it in cases of rheumatism, unaccompanied by excitement of the vascular system, or tendency to congestion and febrile reaction. It is proper, however, to observe, that he combined other agents with it, so that his experiments are by no means decisive as to its efficacy. Of the three patients, to whose cases he refers, one only was cured : the other experienced improvement. Karsten found none of the advantages, described by Reich, in rheumatic and gouty cases, from its use. In a case of *rheumatic headach*, Tschopke found surprising benefit from frictions of creasote, and plugging the ear with cotton dipped into it. The creasote immediately excited acute pain, and some rubefaction of the skin ; and as the burning ceased, the pain ceased along with it.

* See, also, Köhler, in *Rust's Magazin*, B. xlv. and *Amer. Journ. of the Med. Sciences*, Feb. 1837, p. 497.

† Riecke, *Op. cit.* S. 170.

‡ *Gazette Médicale de Paris*, Nov. 1836.

§ Elliotson, in *Med. Chirurg. Transact.* xix. 221. Lond. 1835.

|| Hufeland's *Journal*, Jan. 1834, and *Revue Méd.*, Mai, 1834.

In Most's experience, lotions of creasote water greatly alleviated the pain of the joints in rheumatism and atonic gout.

17. In *vomiting*, not arising from inflammation or other organic disease of the stomach, Elliotson* found creasote very efficacious. In the *vomiting of pregnancy* it has been found highly efficacious. If the sickness comes on regularly after rising in the morning, Dr. Cormack† prescribes two or three drops to be taken five or ten minutes before getting out of bed. This he has generally found effectual; but if it should not be, the patient is directed to repeat the dose in two hours. In more troublesome cases, when the sickness occurs at intervals during the day, one or two drops are given every two, three, or four hours.

He has also found it serviceable in the *sickness and vomiting following a drinking debauch*. Even in *Asiatic cholera* and in *sea-sickness*, it appeared to allay the vomiting. In various affections of the stomach, as in *cardialgia* and *gastrodynia*, it may be found useful.‡ In cases of vomiting from nervous excitability it has been affirmed to excel all known medicines.§ After Dr. Elliotson had recommended it, Dr. Shortt tried it in about a dozen cases, and found it equally successful, as did also Prof. A. T. Thomson, of London, Dr. Bodington of Erdington in Warwickshire, Dr. Christison,|| and many others. Dr. John Walker of Glasgow, in a case published by him,¶ does not appear to have been equally fortunate; and with Dr. Paris it entirely failed.** The author's own success has been by no means as great as that of Dr. Elliotson. In many cases, indeed, it has developed irritability of the stomach, where it did not previously exist.††

Dr. Elliotson admits, that in large doses it seems to excite vomiting, and that when given in such quantities with a view to check it, no good, but evil, results from a large dose. As a *pre-ventive of sea-sickness* it has been extolled by Dr. Elliotson, and by Mr. A. B. Maddock.‡‡

It has been administered, also, as an excitant to relieve *gastrodynia* and *flatulence*, and where hydrocyanic acid and crea-

* Medico-Chirurgical Transactions, vol. xix., and Lancet, Aug 20, 1836.

† Lond. and Edinb. Monthly Journal of Med. Science, Oct. 1842.

‡ Riecke, Op. cit. S. 172.

§ Cormack, on Creasote, p. 133.

|| Dispensary, p. 377. Edinb. 1842.

¶ Lancet, Dec. 19, 1835, p. 447. See, also, Mr. Taylor, Ibid. Aug. 15, 1835, and Dr. Macleod, in Lond. Med. Gazette, xvi. 598, and xvii. 653.

** Pharmacologia, 8th edit. append. Lond. 1838. See, also, Pereira, Elem. of Mat. Med. and Therap. 2d edit. p. 420, Lond. 1842; or Amer. Edit. by Dr. Carson, Philad. 1843.

†† Cormack, Lond. and Edinb. Monthly Journal of Med. Science, Oct. 1842.

‡‡ Amer. Journ. of the Med. Sciences, Feb. 1838, p. 496.

sote have been separately tried unsuccessfully, Dr. Elliotson recommends, that they should be combined.

18. Several portions of *tænia* having been observed to be discharged after the administration of creasote, Kraus was induced to prescribe it as a powerful anthelmintic. This he did in numerous cases, and with the best success; from five to eight drops being given to adults with castor oil; or where the bowels were not freely opened with half a drop or a drop of croton oil.

19. In *diabetes mellitus*, creasote was first given by Berndt,* and with striking success. One or two cases of the same kind are related by Gadolin; but Rehfeld used it without advantage. Dr. Elliotson agrees with Berndt in the opinion, that it is sometimes of use in diabetes, and may even be greatly instrumental in accomplishing a cure.†

20. Dr. Elliotson‡ tried creasote in *nervous diseases*. In some cases of *epilepsy*, the paroxysms appeared to be rendered less frequent and more mild; but in the generality of cases, they returned with fresh violence. In some cases, the remedy had no influence on the disease; in others it appeared to aggravate it. In *neuralgia*, great advantage was at times derived from it, although, here, again, it was frequently of no service.§ Dr. Elliotson also observed good effects from it in *hysteria*, where there was no inflammatory complication, in *spasmodic erethism of the nervous system*, and in *palpitation*; and Dr. Herndon|| of Virginia, used it with much benefit as an inhalation in *hysterical croup* (thirty drops to the quart of hot water).

In *asthma*, dependent upon morbid excitability of the bronchial mucous membrane, Dr. Elliotson¶ found its inhalation to be often useful.

21. In two cases of *chronic glanders*, the same gentleman** accomplished a cure in the course of a few weeks, by the sedulous use of an injection of a dilute solution of creasote (*Creasot. gtt. 1; Aquæ, 3j.*) thrown up the affected nostril; combining the treatment, in one of the cases, with the internal use of the remedy; and a similar case of success is given in a more recent number of a British medical periodical.††

* Kleinert's Repertorium, Jan. 1835, and Lancet, July 18, 1835.

† Medico-Chirurgical Transactions, xix. 132-135. Lond. 1835.

‡ Op. cit.

§ Cormack, loc. cit.

|| Dunglison's Amer. Med. Intelligencer, Mar. 15, 1838, p. 425.

¶ Op. cit.

** Lancet, for June 20, 1833.

†† Ibid. Jan. 20, 1839, p. 145.

MODE OF ADMINISTERING.

The dose for internal use is one or two drops, given several times a day, in gum water.* In cases of tape-worm, the dose should be larger. Some give it in emulsion, but this form is objectionable on account of its disagreeable taste. It is best administered in pill. Externally, it is at times applied pure; at others diluted, — commonly with water, with or without the addition of alcohol, or in the form of ointment. Carminati† affirms that oil and mucilage, when combined with it, render it milder, but that vinegar increases its action. Dr. Cormack,‡ however, doubts the assertion in regard to vinegar. In three comparative experiments, which he made with a view of testing the justice of Carminati's conclusion, there was no apparent difference in the activity of creasote, when given with acetic acid or alone. He was led to believe, however, that the addition of albumen caused it to act more powerfully, which, if true, would be singular.

The inhalation of creasote vapour may be accomplished by diffusing a few drops of creasote through water or a mucilaginous liquid, in an ordinary inhaling vessel, or in the mode described under the head of Chlorine.§

Pilulæ creasoti.

Pills of creasote.

R. Creasoti, ℥x.
 Glycyrrhiz pulv. ℥i.
 Mucilag. acac. q. s. ut fiat massa.
 in pilulas xx. dividenda.

Dose. — Two pills three times a day. In *neuralgia*, *atonic rheumatism*, and *chronic bronchitis*. The number of pills may be gradually increased to eight or ten at a time.

Joy.||

* It may be well to remark, that the fluidram contains one hundred and fifty drops of creasote.

† Op. cit.

‡ Op. citat. p. 88.

§ See page 150.

|| Tweedie's Library of Medicine, v. 282. Lond. 1840; or 2d Amer. edit. iii. Philad. 1842.

R. Creasot. ℥j.
 Ext. glycyrrhiz.
 Galban. āā. ℥ss.
 Althææ pulv. ℥ij.
 Fiat massa in pilulas cxx. dividenda.

Dose. — Six pills, four times a day. In *consumption*.
 Reich.

R. Creasoti,
 Ext. glycyrrhiz. āā. ℥i.
 Althææ pulv. ℥ij.
 Fiat mass. in pil. cxx. dividend.

Dose. — Five pills morning and evening, in *atonic gout*.
 Reich.

Haustus creasoti.

Creasote draught.

R. Creasot. ℥i.
 Aquæ camphoræ,
 Infus. gentian. compos. āā. f.℥vj.
 M. fiat haustus.

To check *vomiting*.

Mistura creasoti.

Mixture of creasote.

R. Creasot. gtt. v.
 Mucilag. acaciæ, f.℥ij.
 Syrup. althææ, f.℥j. M.

Dose. — A spoonful every three hours in *hæmoptysis*.
 Santini.

Tinctura creasoti pro gingivis.

Tincture of creasote for the gums.

R. Creasot. ℥j.
 Alcohol. f.℥ij. M.

As much of this to be added to cold water as is necessary to give it a piquant taste, with which the teeth may be washed and

the mouth rinsed. Used in cases of *factor of the mouth* from carious teeth, and to limit the *caries*.

Buchner.

R. Alcohol. (36° B.) f.℥iss.
 Creasot. f.℥j.
 Tinct. cocci, f.℥vj.
 Ol. menthæ, gtt. xxxvj.

Used for the *toothach*: and, diluted, as a wash for the gums.
*Righini.**

R. Creasot.
 Alcohol. āā. ℥ss. M.

To be applied to *carious teeth*. *Radius.*

R. Creasot. p. i.
 Alcohol, p. viij. M.

This is the ordinary strength of the tincture. Used where fractions of a drop of pure creasote are prescribed.

Lotio creasoti.

Lotion of creasote.

R. Creasot. ℥ss.
 Aquæ destillat. f.℥v. M.

Used as a lotion in *impetigo sparsa* and *itch*.

Wolff.

The author has occasionally found a lotion composed of f.℥ss. of creasote to Oj. of water too irritating.

R. Creasot. gtt. xij.
 Aq. destillat. f.℥ij. M.

To be applied by means of a hair pencil twice a day to *inflamed eyelids*. *Coster.*

R. Creasot. ℥iij.
 Tinct. lavand. compos. ℥xx.
 Aquæ destillat. f.℥ss. M.

G. T. Black.

* Journal de Chimie Méd. Avril, 1841.

- R. Creasot. gtt. iv.
Aq. destillat. f.℥ij. M.

In *irritation of the gums.*

Frémanger.

- R. Creasot. f.℥ss.
Acaciæ, ℥iss.
Aquæ camphor. f.℥xss. M.

Used every two hours, in cases of *aphthous ulceration of the mouth.*

Magendie.

- R. Creasot. gtt. x.
Aceti, f.℥ij.
Aquæ, f.℥ij. M.

Used in cases of *phagedenic ulceration*, and to *chancres*; applied by means of a camel's hair pencil.

*Shortt.**

Unguentum creasoti.

Ointment of creasote.

- R. Cerati,
Ol. amygdal. ââ. ℥j.
Creasot. gtt. xxx. M.

A dressing in *scrophulous caries.*

Frémanger.

The *Unguentum Creasoti* of the London and United States Pharmacopœias is composed of half a fluidram of creasote to an ounce of lard.

Linimentum creasoti.

Liniment of creasote.

- R. Creasot. gtt. v. — xx.
Ol. oliv. ℥ss. M.

To be rubbed two or three times a day on the diseased parts, in *chronic herpes.*

Corneliani.

* Cormack, Op. cit. p. 112.

LVIII. CUBE'BA.

SYNONYMES. Cubebæ, Piper Cubeba, P. Cubebæ, P. Caudatum, Cubebs.

French. Poivre à queue, Cubèbe.

German. Kubebenpfeffer, Schwanzpfeffer.

Cubebs are the fruit of *Piper cubeba*, which grows in India, Java, Guinea, &c. SEXUAL SYSTEM, Diandria Trygynia; NATURAL ORDER, Piperaceæ. The corns of this plant have been long known in the shops; and in the old Wirtemberg Pharmacopœia they figure as calefacient, inciting, discutient, antinervous, and carminative agents, which seem to have a specific action in *vertigo*; hence they obtained the name "*Schwindelkörner*" or "grains for vertigo." They had, however, fallen into oblivion, until they were re-introduced in modern times into practice, especially by the English physicians and surgeons.

The shell of the dried berry has a weak taste, but smells agreeably; the kernel has a bitter aromatic flavour, which is biting at first, but afterwards cooling. The corns were analysed by Tromsdorff and by Vauquelin;* but the most recent analysis is by Monheim.† He found, in 100 parts, of lignin 65, of extractive matter 6, of *Cubebin* (Piperin) 4.5, of a matter like wax 3, of green volatile oil 2.5; of yellow volatile oil 1.0, of balsamic resin — which, according to Vauquelin, is very analogous to balsam of copaiba — 1.5, of chloride of sodium 1.0, and 15.5 parts lost. Cubebin appeared to Monheim to be identical with piperin, but to be united with an acrid soft resin.

The volatile oil may be obtained separately by distillation with water.

EFFECTS ON THE ECONOMY.

In addition to the general excitant properties of the peppers, the action of cubebs is exhibited on the urinary and genital organs. Under their use, the secretion of urine is augmented; it becomes of a darker colour, and assumes an aromatic odour. Cubebs have been advised, in modern times — *first*, in cases of *gonorrhœa*, in which they have been esteemed a specific by many. Yet the considerations that apply to copaiba are equally applicable to cubebs. Although the revulsive effect induced by

* Mémoir. du Muséum, vi. 225.

† Journal de Pharmacie, xx. 403.

both on the kidneys may mitigate the inflammatory condition of the lining membrane of the urethra, which constitutes gonorrhœa; yet, in violent inflammatory cases, and in the early stages of ordinary cases, they may be injurious, and there are many cases on record in which bad consequences appear to have resulted from their improper administration. Still, there are many physicians who administer both them and the copaiba in every stage of the disease. Of 50 patients, treated by Mr. Broughton* by cubebs, 10 were cured in from 2 to 7 days; 17 in from 8 to 14; 18 in from 15 to 21; 1 on the 55th day; and in 4 only was no success obtained.

In the chronic stage of gonorrhœa, M. Ricord† prescribes cubebs in combination with sesquioxide of iron; and in addition the patient is directed to inject, four times a day, a solution composed of *Aq. destillat. f. 3viiij.*, *Argent. nitrat. gr. ij.*

It has been affirmed, that different evils have ensued from the use of cubebs; which ought to suggest care in their administration: for example, — ardor urinæ; fever; inflammation of the urethra, bladder, and testicles; retention of urine; cutaneous eruptions, &c.‡

In the *blennorrhœa* of females, cubebs are equally extolled by many practitioners, as well as in *leucorrhœa*.§

Spitta found them very efficacious in old and obstinate cases of *coryza*, when given in the form of lozenges: they are said, likewise, to have been administered with advantage in *defective audition*, caused by a catarrhal affection of the Eustachian tube. Rosen found the chewing of cubebs very serviceable in cases of *aphonia*. They have also been prescribed successfully in cases of *chronic rheumatism*. Pül|| gave them with striking advantage in *intermittent fever*; and in India, they are regarded to be aphrodisiac.¶

According to Dr. Paris, it is important to keep the bowels open during their use, for when hardened fæces are allowed to accumulate, the spice insinuates itself into the mass, and occasions excoriations in the rectum.**

* Medico-Chirurgical Transactions, xii. 1. Lond. 1822.

† La Lancette Française, No. 33. Paris, 1838.

‡ Lond. Med. and Physical Journal, Mar. 1832, and Mérat and De Lens, Dict. Univers. de Matière Médicale, &c. Art. Piper Cubeba.

§ Edinb. Med. and Surg. Journal, xviii. 319. Blundell, Diseases of Women, p. 158, Lond.; or Dunglison's American Medical Library Edition, Philad. 1840; also, Lisfranc by Pauly, translated by Lodge, p. 243. Boston, 1839; and Ricord, Practical Treatise on Venereal Diseases, by Drummond, Amer. Edit. Philad. 1843.

|| Recueil de Méd. Chirurg. et Pharm. Militaire, xvi.

¶ Mérat and De Lens, Art. cit.

** Brande, Dictionary of Materia Medica, p. 205. Lond. 1839.

MODE OF ADMINISTERING.

Cubebs are commonly given in the form of powder, and in doses of from 1 to 2 and even 4 drams, repeated once or oftener in the day. Lozenges, boluses, and electuaries, are likewise prepared of them; and the London, Dublin, and United States Pharmacopœias have a *TINCTURA CUBEBAE* (*Cubeb. ʒiv., Alcohol. dilut. Oij. Dose, fʒi. — fʒij.*). In consequence of the disorder, at times induced by them in the digestive function, Velpeau proposed, that they should be given in the form of glyster, to the amount of one or two drams of the powder, suspended in five or six ounces of an oily vehicle; and this method has its advantages.* To attain the same object, M. Dublanc, Junr., prepared an *oleo-resinous extract*, one-sixteenth part of the weight of which possessed equal virtues with one part of cubebs; five grains, three times a day, acting like the ordinary quantity of powdered cubebs.†

The volatile oil is sometimes given in the dose of 10 or 12 drops, suspended in water by the aid of sugar, or associated with oil of copaiba. *Gelatinous capsules of cubebs*, containing the oil, are sometimes taken.

Recently, M. Piorry‡ has strongly recommended an *INFUSION OF CUBEBS* (*Cubeb. ʒi., Aquæ Oij.*) to be used six or eight times a day as an injection in urethritis and vaginitis.

*Pulvis cubebæ compositus.**Compound powder of cubebs.*

R. Cubebæ pulv. ʒi.
Ergotæ pulv. ʒss.
Pulv. aromat. ʒij.
Sacchari, ʒj.

Divide in chartulas viij.

Dose. — One, three, or four times a day in *gonorrhœa, leucorrhœa, gleet, prostatic and involuntary seminal discharges.*

Ryan. §

* Archives Générales de Médecine, xiii. 47.

† Journ. de Chimie Médicale, iii. 491, and Journ. de Pharmacie, xiv. 40.

‡ Gazette des Hôpitaux, Mai, 1842.

§ Universal Pharmacopœia, or a Practical Formulary of Hospitals, both British and Foreign, by Michael Ryan, M. D., &c., &c. 3d edit. p. 160. Lond. 1839.

R. Cubeb. pulv. ℥ij.
Aluminis pulv. ℥ss. M. et divide in chart. ix.

One to be taken three times a day.

*Ricord.**

Electuarium cubebæ.

Electuary of cubebs.

R. Cubeb. pulv. ℥ss.
Mellis despum. q. s.

Fiat electuarium.

Dose. — A tea-spoonful, three or four times a day, in *catarrhus vesicæ, c. urethræ, &c.*

Radius.

R. Copaib. ℥ivss.

Subige cum

Vitello ovi unius, et

Adde

Cubeb. pulv. ℥ivss.

Confect. rosæ, ℥ss.

M. fiat electuarium.

Dose. — A tea-spoonful, three or four times a day.

Vogt.

R. Copaib.

Cubeb. pulv. āā. ℥ij.

Aluminis, ℥j.

Extract. opii, gr. v. M.

Dose. — A dram, night and morning, in the pulp of a prune. The quantity may be rapidly increased to two drams morning and evening.

R. Copaib. part. i.

Cubeb. pulv. part. xij.

Tinct. vanillæ, q. s. M.

Dose. — ℥j. three times a day.

Cazenave.†

* Mathieu, Journal des Connais. Méd. Chirur. Juin, 1840.

† Bouchardat, Annuaire de Thérapeutique pour 1842, p. 44. Paris, 1842.

Trochisci cubebæ.

Lozenges of cubebs.

R. Cubeb. pulv. ℥ij.
 Tolut. gr. vj.
 Admisce
 Syr. myroxyl.
 Ext. glycyrr. āā. ℥j.
 Acaciæ q. s. ut fiat massa in trochiscos pond. gr. x. dividenda.

Used in *coryza*.*Spitta.*

Boli cubebæ.

Boluses of cubebs.

R. Copaib.
 Acac. pulv. āā. ℥ij.
 Aquæ flor. aurant. ℥ij.
 Terendo bene mixtis adde
 Cubeb. pulv. ℥ij.
 Misce, et fiant boli No. vj.

Dose. — One, three times a day.

Henschel.

M. Labelonye* has recently proposed the following method for separating all the principles of cubebs from the ligneous matter.

Cubebs, reduced to coarse powder, are placed in an apparatus for displacement and exhausted by *ether*, which dissolves the wax, volatile oils and balsamic resin. The residue is submitted to the action of *dilute alcohol* at 20° (.935), which dissolves the extractive principle, and chloride of sodium. The alcohol and ether are separated by distillation in part, and separately. Evaporation of the hydro-alcoholic solution is then carried on in a water bath until it possesses the consistence of a soft extract, to which the ethereal product is added; the evaporation being continued for a short time, the ether is completely volatilised, and a strongly aromatic extract is obtained, as consistent as honey. This it is improper to subject any longer to the action of heat, on account of the contained volatile oils; the presence of which in all cases interferes with complete desiccation.

* Bulletin Général de Thérapeutique, and Amer. Journ. of Pharmacy, 2d series, vol. 2, p. 316. Philad. 1837.

One part of this extract is conceived to be equal to five of the cubebs.

This extract can be readily mixed with water by means of mucilage, and can be administered in potions, injections, &c.

The best form of exhibition, according to M. Labelonye, is in lozenges, or in an emulsive syrup.

Trochisci extracti hydro-alcoholici ætherei cubebæ.

Lozenges of the ethereal hydro-alcoholic extract of cubebs.

R. Ext. hydro-alcohol. æther. cubeb. ℥viiij.
Alcohol. Oij.

Solve et adde

Sacchar. in pulv. ten. ℥j.
Ol. menthæ pip. gtt. xviiij.

Pour the mixture into flat vessels upon a stove, and allow the alcohol to evaporate at a moderate heat. When the mass is completely desiccated, reduce it to a fine powder, and add a sufficient quantity of mucilage of gum tragacanth to form lozenges — 18, 12, 9, or 6 grains each. Most persons, M. Labelonye says, can swallow with facility those weighing eighteen grains, and containing six grains of the extract: ten of these are equivalent to half an ounce of the powder.

Syrupus extracti hydro-alcoholici ætherei cubebæ.

Syrup of the ethereal hydro-alcoholic extract of cubebs.

R. Ext. hydro-alcohol. æther. cubeb. ℥iiij.

Suspende ope mucilaginis in

Aq. menthæ pip. ℥j.

Adde

Sacchar. ℥ij. M.

Four ounces of this syrup contain two drams of extract, equivalent to ten of powdered cubebs.

Dose. — A tea-spoonful.

M. Labelonye envelopes the extract also in sugar, as in the ordinary sugar-plumb.

An EXTRACT OF CUBEBS has been recommended to be prepared as follows: — The cubebs are exhausted by repeated digestion in alcohol, which readily takes up all the active principles of the pepper; viz., a resin resembling that of copaiba, and a coloured resin, with an almost concrete essential volatile oil. The alcohol

is distilled from those tinctures at a temperature so moderate as not to volatilize the essential oil. When the operation can be carried no farther in this manner, the evaporation must be continued in an open vessel by the aid of a water bath, at a still lower degree of heat; a little finely pulverized Spanish soap must now be added to prevent the separation of the resin, and preserve the extract of a uniform consistence.

The ordinary dose of this in *blennorrhœa* is about fifteen grains three times a day.*

Dr. Puchet employs a liquid *aqueous extract* of cubebs; a *liquid alcoholic extract*; a *syrup of the alcoholic extract*; a *bolus* of cubebs; and one of cubebs, copaiba and turpentine. The last he covers with a gelatinous mixture to obviate the unpleasant taste.

LIX. DELPHINIA.

SYNONYMES. Delphinina, Delphininum, Delphininium, Delphium, Delphina, Delphia, Delphinine, Delphine.
German. Delphinin.

This alkaloid was discovered in 1819, by MM. Feneulle and Lassaigne,† and, almost at the same time, by Brandes,§ in the seeds of *Delphinium Staphisagria*, in which it is united with acetic acid. As a therapeutical agent, it has been chiefly recommended by Turnbull; but he did not employ it in its pure state.

METHOD OF PREPARING.

The plan recommended by Magendie|| is to boil a portion of the *seeds of delphinium*, cleared of their coverings, and reduced to a fine paste, in a little *distilled water*; to pass the decoction through linen cloth, and filter. *Pure magnesia* is now added, and the mixture is boiled for some minutes; the filtration is repeated; and the residues washed carefully and digested in *alcohol*. On evaporating the alcoholic tincture, delphinia is obtained in the form of a white powder, having some crystallised points.

* Mr. W. H. Judd, Medico-Botanical Transactions, vol. i. p. 4. Lond. 1839.

† Journ. de Connaiss. Médical. Août, 1840.

‡ Annales de Chimie, tom. xi. xii., and Journal de Pharmacie, vi. 47 and 366.

§ Schweigger's Journal der Chemie, xxv. 369.

|| Formulaire, &c.

This is esteemed the most simple mode ; but if a large quantity be required, the following plan is advised — on account of the time and patience necessary to decorticate the seeds.

Submit the *unclean seeds*, when well bruised, to the action of *weak sulphuric acid*. Precipitate the liquor by *ammonia*, and redissolve in *alcohol* the delphinia, which is still slightly coloured. To purify it, draw off the alcohol by distillation, dissolve the residuum in *muriatic acid*, and boil with *magnesia*.

The plan recommended by Couerbe, and adopted by Turnbull,* is to evaporate a *saturated tincture of the seeds* to the consistence of a thin extract, and then to treat it with *water acidulated with sulphuric acid*. This solution, when filtered, is to be precipitated by *ammonia*. The precipitate — after being freed from its water — is to be taken up by *alcohol*, and again reduced to the consistence of an extract, which is likewise to be dissolved in *acidulated water* ; to this solution, filtered, a small quantity of *nitric acid* is added, as long as any precipitate is thrown down. The liquid, freed from this precipitate, is again to be subjected to precipitation by *ammonia*, and the powder is dried. This is the *delphinia of commerce* ; but like veratria, it is a compound substance, and consists of *resinous matter*, *staphysagrin* and *delphinia* ; the delphinia is obtained by treating the powder with ether, which takes up the delphinia, and leaves the staphysagrin.

When in a state of purity, delphinia is white, pulverulent, and devoid of smell ; but like veratria, when applied to the mucous membrane of the nose, it occasions sneezing, along with an abundant secretion of mucus. Its taste is at first bitter, and afterwards acrid, and it acts upon animals in the same manner as — but more energetically than — the seeds whence it is prepared. It is very sparingly soluble in water, but yet in sufficient quantity to communicate a bitter taste to the fluid. In alcohol and ether it dissolves readily ; and these solutions have the property of rendering syrup of violets green, and of restoring the blue colour of litmus, when reddened by acids. It combines readily with acids, and forms neutral salts, which are possessed of much bitterness and acridity ; and it may be precipitated from solutions of these in the form of a jelly by the addition of an alkali.

EFFECTS ON THE ECONOMY.

From the experiments of Orfila,† delphinia appears to belong to the class of acro-narcotic poisons. In the dose of about five grains, it proves fatal to dogs ; and the fatal result is more

* On the Medical Properties of the Natural Order Ranunculaceæ, Chapter II. Lond. 1835.

† Nouveau Journal de Méd. x. ; and Toxicologie Gen. i. 739.

speedily induced when the delphinia is dissolved in weak acetic acid; the animal, in the latter case, dies in the space of from forty to fifty minutes. When diffused through water introduced into the stomach of a dog, and retained there by a ligature placed around the gullet, efforts to vomit supervened, with restlessness, giddiness, immobility, slight convulsions, and death in two or three hours. In this case, the mucous membrane of the stomach was generally found injected.

From his administration of delphinia and its salts, Turnbull concludes, that the pure alkaloid has little effect on the mucous membrane of the stomach and bowels. It may be given, he says, in some cases, to the extent of three or four grains a day, in doses of half a grain each, without exciting vomiting; in this quantity, however, it sometimes operates upon the bowels, but causes very little irritation. In most instances, it acts as a diuretic, and occasions a considerable flow of pale urine. When taken to the extent of a few grains, it induces heat and tingling in various parts of the body, similar to those produced by rubbing it upon the skin; and its other effects are very nearly the same as those of the salts of veratria.

The preparations of delphinia have been used in the same diseases as those of veratria, and they appear to exert a similar action: the test laid down by Turnbull, in the case of veratria, applies equally to delphinia; — namely, unless a solution of delphinia in alcohol, in the proportion of four grains to a dram, occasions a distinct sensation of heat and pricking, when rubbed for three or four minutes on the forehead, the specimen ought not to be used, as no beneficial effect would arise from its application. When rubbed upon the skin, it gives rise to a sensation of burning, not unlike that which manifests itself a short time after the application of a blister, but not to an unpleasant degree, unless the friction has been carried too far. The effects of delphinia differ from those of veratria in being generally more powerful and durable.

The diseases in which delphinia has been chiefly used, like veratria, are — *tic douloureux*, *paralysis*, and *rheumatism*. In the first of these, when the affection is seated in the tongue, or at the point where the infra-orbital nerve escapes from its foramen, the use of delphinia, according to Turnbull, is to be preferred, because it can be applied to the tongue, or rubbed on the gums, without occasioning irritation of the mucous membrane. He thinks it, also, upon the whole, better adapted for the treatment of paralytic cases than veratria, but principally on account of the property it has “of exciting the circulation in the diseased part.”

MODE OF ADMINISTERING.

The manner of applying delphinia is the same as that recommended for veratria. It may be used either in the form of OINTMENT or in SOLUTION in alcohol; and the proportions to be employed, in either case, may vary from ten to thirty or more grains to the ounce, according to the severity of the affection, for the treatment of which it is prescribed. The duration of the friction should be regulated in the same manner, or it should be continued until the pungent sensation, produced by the rubbing, exhibits itself.

LX. DIOS'MA.

SYNONYMES. *Diosma Crenata* (folia); *Barosma Crenata* (folia); *Agothosma Crenatum* (folia); *Bocchoe*, *Bocho*, *Boocho*, *Buckha*, *Buchu Leaves*.
German. Buccublätter; Duftstrauchblätter.

Diosma crenata is indigenous at the Cape of Good Hope. It belongs to the NATURAL FAMILY Rutaceæ; SEXUAL SYSTEM Pentandria Monogynia.

The smell of the leaves is penetrating and peculiar, but resembling that of rue and camphor. By some, it has been compared to that of oil of juniper; by others, to rosemary; by others, to cumin, and by the others, again, to that of the urine of the cat. The name is, therefore, by no means expressive. It appears to be derived from the smell, — *dios*, "divine," and *οσμη*, "odour." The taste of the leaves is aromatic; somewhat pungent; and, in the opinion of Buchner, resembling that of peppermint; without any particular bitterness, yet disagreeable. According to the analysis of Buchner, Brandes, and Cadet, the most important constituents appear to be a volatile oil of a greenish-yellow colour, a peculiar principle — *diosmin*, and a semi-resinous substance. Diosmin is a very tenacious adhesive matter, similar to Peruvian balsam, and can be drawn out in fine threads. It has the same smell as the leaves, only somewhat weaker; the taste is pungent and bitter. The semi-resinous matter has a resinous lustre; is of a dark brown colour, becomes fluid when heated, and burns with a flame. Its odour is not remarkable: the taste is somewhat pungent and sourish.*

* See *Journal de Chimie Médicale*, iii. 13, and *Journal de Pharmacie*, xiii. 106.

EFFECTS ON THE ECONOMY IN HEALTH.

The Hottentots have long used the leaves of several varieties of *diosma* both internally and externally ; but they give the preference to *Diosma crenata*. Through them its virtues became known to the European settlers. It was first brought to the notice of British practitioners by the notorious Richard Reece, who is more known for the part he took in the farce of Joanna Southcote than for any thing else. In Germany, it was chiefly promulgated by Jobst, who published an extract from Reece's observations in the *Repertorium* of Buchner.*

Bardili instituted experiments for testing the action of the remedy on the healthy organism. It first acts — he says — as an excitant on the stomach, whence arises a feeling of increased heat in that organ, and the appetite becomes augmented : from the stomach, the excitement spreads to the vascular system ; the heat of the body is increased ; the pulse becomes more frequent, and the transpiration is favoured. It acts, likewise, on the urinary secretion ; the urine is separated in larger quantity, contains flocculi, deposits a purulent (?) sediment, and exhales an aromatic odour. On the digestive function, it seems to produce somewhat of a constipating effect. Bardili thinks, that he has also witnessed some narcotic operation in his experiments.

The same results were produced by *Diosma* on animals.

EFFECTS ON THE ECONOMY IN DISEASE.

The inhabitants of the Cape administer this agent as a stomachic, and the Dutch physicians give it with success in *indigestion*. It is said, also, to have afforded essential service in *chronic cases of rheumatism* and *gout*. Autenrieth extols it in *rheumatic pains*, which have had their foundation in repelled itch (?) ; and its utility in *chronic rheumatism* has been confirmed by numerous others. It has been extolled, moreover, in *hæmaturia*, *calculous pains*, and in *irritated and suppurative conditions of the bladder, urethra, and prostate*. The author has repeatedly administered it, but has observed no other effects than those of a moderate excitant and tonic.† Reece says he found it efficacious in *incontinence of urine*, and in *catarrhus vesicæ* ; and he gave it — united with tincture of cubebs — in *spasmodic stricture of the urethra, gonorrhœa, swelling of the prostate, and impotence*.

* Band. xxii. S. 51.

† See his *General Therapeutics and Materia Medica*, vol. i. p. 302. Philad. 1843.

By the inhabitants of the Cape of Good Hope, buchu leaves are often applied externally, both in the form of liniment and of baths, in *luxations* and *rheumatic pains*, — as well as of fomentations and cataplasms; and in *wounds*, especially the contused.

It may be remarked, that this — like almost every similar remedy — has been given in *cholera*; and, as the Riga physicians assert, frequently with favourable results.

MODE OF ADMINISTERING.

The dose of the powder is $\mathfrak{z}\text{ij}$. in the day; this, at least, is the common dose at the Cape. The infusion necessarily contains more of the volatile oil than the decoction; but, on the other hand, the latter has more of the diosmin: as respects their action, however, there is not much difference. A *vinegar*, *oxymel*, *liniment*, *extract*, and *tincture* of diosma have been advised.

The London, Edinburgh, Dublin, and United States Pharmacopœias have an INFUSUM DIOSMÆ ($\mathfrak{z}\text{ss}$. of the leaves to Oss. of water, Pharm. U. S.); dose, $\text{f}\mathfrak{z}\text{ss}$: and the Dublin, a TINCTURA BUCHU ($\mathfrak{z}\text{ij}$. of the leaves to Oj. of proof spirit); dose, $\text{f}\mathfrak{z}\text{ij}$. or $\text{f}\mathfrak{z}\text{ijj}$.

Infusum diosmæ compositum.

Compound infusion of buchu.

R. Diosm.

Uvæ ursi, ââ . $\mathfrak{z}\text{ss}$.

Aq. bullient. Oss.

Digere leni calore in vase clauso per semihoram. Colaturæ adde

Syrup. seneg. $\text{f}\mathfrak{z}\text{ss}$.

Dose. — One or two spoonfuls every two hours, in *blennorrhœa*, and in *atony* and *paralysis of the bladder*.

Clarus.

R. Infus. diosmæ, $\text{f}\mathfrak{z}\text{vij}$.

Tinct. diosmæ,

— Cubebæ, ââ . $\text{f}\mathfrak{z}\text{iv}$. M.

Dose. — Two table spoonfuls three times a day. This formula is recommended by Dr. Joy* “in *chronic diseases of the prostate, bladder, and kidneys, gravel, &c.*,” as if the pathological condition to be rectified were, in all these cases, identical! (See page 145.)

* Tweedie's Library of Medicine, v. 311. London, 1840; or 2d American edit. vol. iii. Philad. 1842.

LXI. ELECTROPUNCTURA.

SYNONYMES. Electropuncture, Electropuncturation.

Electropuncture consists in a union of acupuncture with electricity. The idea of the conjunction appears to have originated with Berlioz ; but Sarlandière was, doubtless, the first who put it in practice, although J. Cloquet has contested the priority with him — a matter, by the way, as in all such cases, of extremely small moment. The operation consists in employing acupuncture in the usual way, either with a single needle, or with two or more ; and making a communication between them and the prime conductor of an electrical machine in action ; or they may be made to form part of the circuit in the discharge of a Leyden jar. In this way, the electrical influence may be graduated from the simple aura to a full shock. Sarlandière appears to have employed electropuncture with great success, but he restricts its use to *rheumatic* or *neuralgic pains*, uncomplicated with organic mischief or inflammation : when such complications exist, he advises bloodletting and general antiphlogistics to be premised.*

Guersent thinks it better, in all these cases, to use simple acupuncture, and only to employ electropuncture, when the first proves to be inadequate, as in paralysis, and in tremors produced by the immoderate use of mercury ; — in all cases, indeed, in which the malady depends on a diminution of the nervous energy. A case of success from its use, in paralysis of the right arm, in which voluntary motion and sensibility were destroyed, has been published.† The patient was, in the first instance, subjected to the use of blisters and moxas along the course of the radial nerve, from which he obtained some advantage. The remedy, which succeeded best, however, was electropuncture along the nerves from the shoulder to the hand. At first, the punctures were but little felt ; but afterwards they were very painful. The sensibility, mobility, and strength of the fingers and hand gradually returned ; and, three months after his admission, the patient left the hospital completely cured.

Magendie affirms, that he has treated many cases of *incomplete amaurosis* with great success by this agent. He employed it, however, in the form of what has been more properly termed *GALVANOPUNCTURE* ; by fixing a needle in the frontal nerve, and

* E. Gräfe, Art. Electropunctura, in Encyclopäd. Wörterb. der Medicinisch. Wissensch. x. 550. Berlin, 1834.

† La Lancette Française, Dec. 20, 1836 ; and Amer. Med. Intelligencer, Oct. 16, 1837, p. 265.

another in the superior maxillary, and making these communicate respectively with the poles of a galvanic pile of twelve pairs of plates, each six inches square. Whenever the contact was made, the patient experienced a painful commotion in the course of the nerves, and at the bottom of the orbit; the light became better appreciated, and the pupil contracted.

The author has frequently used both electropuncture and galvanopuncture in *rheumatic* and *neuralgic affections*; but he does not think the advantages were more marked than those of simple acupuncture, whilst the suffering from the operation was certainly greater. Magendie, however, regards electropuncture as the remedy *par excellence* in the treatment of *obstinate neuralgia*.*

In cases of *asphyxia*, galvanopuncture has been proposed to arouse the dormant energies. The effect of electricity, in the different forms in which it is adopted in medicine, on the functions of sensibility and muscular contraction, could not fail to suggest it early to observers as a fit agent for this purpose; but it is rarely at hand, and, therefore, seldom available. J. P. Frank, Thillaye,† and others have highly recommended it;—the latter gentleman, on the strength of numerous experiments on animals. As the object, in these cases, is to arouse the respiratory muscles to action, the electric shock may be passed through the shoulders or the chest in any direction. Neither common nor galvanic electricity is possessed of much—if any—power to restore the action of the involuntary muscles. The author has frequently attempted to re-excite the action of the heart, intestines, fibres of the uterus, &c., soon after the cessation of respiration and circulation, by means of the galvanic stimulus, but without the slightest success, although the voluntary muscles responded to it energetically. Besides, were the action of the heart re-excited by it, this could be but momentary. A necessary stimulating agency to that viscus is distension by the proper fluid, and unless the respiratory movements were restored, and conversion of venous to arterial blood effected, so that the latter could reach the left heart, the action of that organ could not be maintained. Every attempt, therefore, is properly made to restore the action of the respiratory muscles, so that hæmotosis may be accomplished.‡

M. Leroy d'Etiolles§ has suggested galvanopuncture in a man-

* Medico-Chirurg. Rev. July, 1841, p. 202; and Dunglison's Amer. Med. Intel. Sept. 1841, p. 69.

† Archives Générales de Médecine, xii.

‡ Art. Asphyxia, by the author, in the American Cyclopedic of Practical Medicine, part x. p. 486, Sept. 1836; and in his Practice of Medicine, i. 428. Philad. 1842.

§ Magendie's Journal de Physiologie, tom. vii. 1827; tom. viii. and tom. ix.; also, Recherches Expérimentales sur l'Asphyxie, Paris, 1829; and Bour-

ner which, at the first aspect, appears most formidable ; but which is really less so than it seems to be, in consequence of the impunity with which fine needles can be made to penetrate, as has been seen,* even the most important organs. He introduced an acupuncture needle on each side between the eighth and ninth ribs, until it reached the fibres of the diaphragm. He then established a galvanic current between the needles by means of a pile of twenty-five or thirty pairs of plates, an inch in diameter. The diaphragm immediately contracted, and an inspiration was accomplished. He then interrupted the circle, when the diaphragm, urged by the weight of the abdominal viscera, and aided by gentle pressure made on the abdomen by the hand, returned to its former position, and an expiration was effected. In this way, the two respiratory acts were made to succeed each other, and regular respiration was reinduced. A continuous current was likewise employed in some cases ; but the respiratory movements were irregular, and nothing like natural respiration resulted.

Leroy tried his method on animals asphyxied by submersion, and when they had not been under water more than five minutes, they were often restored.

These experiments were witnessed by Magendie.† On different occasions, M. Leroy asphyxied animals of the same kind, and apparently of the same strength, and while those that were left to themselves perished, those that were treated by galvanism recovered.

As an aid, therefore, to pulmonary insufflation, and an important one, galvanism,—combined or not with acupuncture,—might be advantageously employed in asphyxia, but, as has been already remarked, it can rarely be available. Certainly no time should be lost in adopting the other energetic and indispensable measures that are demanded.‡ It has been recommended, that as only a very small apparatus is necessary, batteries, consisting of a few plates, might be kept wherever there are station-houses for the reception of persons in a state of asphyxia.§ The suggestion is good ; and they might also with propriety form a part of the cabinet of apparatus of the private practitioner ; but whilst an assistant is preparing the apparatus for action, the practitioner should be assiduously engaged in applying other means of resuscitation.||

geois, *Observations sur la possibilité du retour à la vie dans plusieurs cas d'Asphyxie*. Paris, 1829.

* See Art. ACUPUNCTURE, p. 45.

† *Journal de Physiologie*, ix.

‡ See Art. Asphyxia, *Op. cit.* p. 486.

§ Kay, in *Edinb. Med. and Surg. Journ.* xxix. and in his work on Asphyxia. Lond. 1834.

|| See Most, Art. Galvanismus, in *Encyclopädi der gesammten medicin. und chirurgisch. Praxis*, u. s. w. 2te Auflage. Leipz. 1836.

M. Zenobi Pechioli* has detailed a case of double *hydrocele*, in which he employed electropuncture. Two needles were inserted, one into the upper, the other into the under, part of the tumour. These were connected to opposite poles of a voltaic pile, and the electric fluid was passed in a continued current for five minutes, when it had to be discontinued in consequence of the right testicle becoming painful. Five minutes after the removal of the needles, both hydroceles disappeared completely. In the evening, redness and heat of the scrotum occurred, and the right side of the scrotum became œdematous. The operation was repeated in ten days, and was followed by a like result. Ten days afterwards, it was again resorted to, after which he had no return of the disease. M. Pechioli is of opinion, that the openings made by the common mode of acupuncturation are too small to allow the fluid to escape, and he thinks, that by passing a current of electricity through the hydrocele, the contained fluid is forced out through the sac into the cellular tissue of the scrotum, whence it is removed by absorption.

LXII. EMETICA.

SYNONYMES. Emetina, Emeta, Emetinum, Emetine.

French. Emetine, La Matière Vomitive.

German. Emetin, Brechstoff.

In the year 1817, MM. Pelletier and Magendie,† by a series of chemical and physiological experiments, discovered, that the various kinds of ipecacuanha are indebted for their emetic properties to a peculiar substance to which they gave the name *Emetine*.

This substance possesses the emetic power in a very concentrated state, and has neither the disagreeable smell, nor the nauseous taste of ipecacuanha. They considered, therefore, that it might be advantageously substituted for ipecacuanha on all occasions.

There are two varieties of the active principle — the *coloured* and the *pure*, which, as Magendie remarks,‡ bear the same relation to each other as moist sugar does to the white and crystal-

* Bulletin delle Scienze Medic. di Bologna, Sept. 1841; and Dublin Journ. of Med. Sciences, Nov. 1842, p. 311.

† Journal de Pharmacie, iii. 145; and Magendie's Formulaire pour la préparation de plusieurs nouveaux médicamens, &c.

‡ Op. cit. :

lised. *Ipecacuanha*, derived from *Cephaelis ipecacuanha*, contains the most emetia.

Emetia has been received into many of the Pharmacopœias, as the Parisian, Batavian, Hanoverian, &c.

MODE OF PREPARING.

1. *Coloured Emetia*. — *Powdered ipecacuanha* is digested with *ether* at 60° ($.720$) to dissolve the fatty matter, whence it derives its disagreeable odour, and which possesses no emetic virtue. When the powder yields nothing more to ether, it is exhausted by means of *alcohol*: the alcohol is then evaporated in a water-bath, and the residue is dissolved in *cold water*. It thus loses some of the wax, and a little fatty matter, which still adhered to it; it is then only necessary to mix it with *carbonate of magnesia*, whereby it loses its gallic acid, — to redissolve it in *alcohol*, and to evaporate to dryness.

By a similar process, M. Boullay obtained from the roots, leaves, flowers, and seeds of *Viola odorata*, an active, alkaline, bitter and acrid principle, similar to emetia from *ipecacuanha*, which he denominates *Emetine of the violet, indigenous emetine* or *violine*. According to Orfila, it possesses highly poisonous qualities.*

2. *Pure emetia*. — This is obtained by substituting *calcined magnesia* for the carbonate used in the process just described, in such quantity, that the acid existing in the liquid may be neutralised, and that which is associated with the emetia be separated from it.

The precipitate of magnesia and emetia must now be washed with a little *very cold water*, to remove the colouring matter, which is not combined with magnesia; and after being carefully dried it must be treated with *alcohol*, which dissolves the emetia. The emetia, obtained by the evaporation of the alcohol, must then be dissolved in a *dilute acid*, and treated with pure *animal charcoal*. After this purification, the emetia must be precipitated by a salifiable base.

The waters, used to wash the magnesian precipitate, still contain emetia, which may be separated by a second series of operations.

Coloured emetia appears in the form of reddish-brown, transparent scales; is almost inodorous, and of a bitter, but not nauseous taste. It can withstand the heat of boiling water without experiencing change; is very deliquescent, soluble in water, and not crystallisable.

* Journal de Pharmacie, Janvier, 1824.

Pure emetia has a white and frequently a somewhat yellowish appearance; is pulverulent, and does not deliquesce, like the former, in the air. In cold water, it is but little soluble; more so in warm. In ether and alcohol, it dissolves readily. Its taste is feebly bitter. It has an alkaline reaction, is dissolved by all the acids — diminishing their acidity, but without wholly neutralising them. With the acids it forms crystallisable compounds, from which it may be precipitated by galls, which are the best agents for obviating the effects of emetia, when given in too large a dose.

EFFECTS ON THE ECONOMY IN HEALTH.

According to Magendie,* from half a grain to two or three grains of coloured emetia given to dogs and cats, excited vomiting, at times followed by long sleep. In larger doses, — ten grains for example, — it occasioned, in dogs, repeated vomiting, after which the animal fell asleep, and generally died in twenty-four hours. On dissection, violent inflammation was found in the lungs, and in the mucous membrane of the stomach and bowels throughout their whole extent. The effects were the same when the emetia was injected into the jugular vein, or absorbed from any part of the body. In a healthy man, two grains of coloured emetia, taken fasting, produced repeated vomiting, to which succeeded decided disposition to sleep. Even a quarter of a grain at times induced nausea and vomiting. It acted also on the bowels.

The effects of pure emetia are analogous, but more powerful; two grains were sufficient to kill a strong dog.

EFFECTS ON THE ECONOMY IN DISEASE.

The same effects are induced on the morbid as on the healthy economy.

Magendie recommends the administration of coloured emetia — as the pure is much too dear — in every case where it is desirable to excite vomiting, and especially where ipecacuanha is indicated. It has not, however, been much used, except by Magendie himself. Lerminier, who prescribed it, says that one or two grains of coloured emetia are equal in strength to from ten to twenty of ipecacuanha; but that he observed no difference in their operation, and Dr. Domeiert appears to have arrived at

* Op. citat.

† London Med. Gaz. Sept. 14, 1839, p. 929.

the same results. The obvious advantages it possesses are — the convenient and agreeable form under which it may be administered, and the circumstance, that several spurious sorts of ipecacuanha are frequently passed off in commerce, and occasion, in consequence, considerable disappointment in the mind of the practitioner. The employment of the active principle of course precludes these inconveniences.*

Prollius, of Wolfhagen, has frequently administered pure emetia, which he recommends as a substitute for ipecacuanha, on the grounds above mentioned; and he properly adds, that the price is not a matter of so much moment as it might seem to be by reason of the very small quantity required to produce the desired effects.

MODE OF ADMINISTERING.

To produce vomiting, three grains of coloured emetia may be dissolved in any vehicle, and given in divided doses, at short intervals. In several cases, Dr. Domeiert† found one grain amply sufficient. Of *pure* emetia, Magendie found, in a man eighty-five years of age, one-sixteenth of a grain sufficient to induce vomiting. He remarks, however, that the man was easily made to vomit. Prollius found the medium dose of *pure* emetia, for an adult, to be from two-sixteenths to three-sixteenths of a grain; sometimes it was requisite to give another sixteenth. Very rarely was it necessary to give more than four-sixteenths, or one-fourth of a grain. As, on account of its sparing solubility, pure emetia, when given alone, might be restricted in its operation, Prollius adds an equal portion of tartaric acid, and a little sugar.

Mistura emetiæ vomitoria.

Emetic mixture of emetia.

R. Emet. colorat. gr. iv.
 Infus. flor. aurant. ℥ij.
 Syrup. flor. aurant. ℥ss. M.

Dose. — A dessert-spoonful every half hour, — to excite vomiting. Any simple distilled water and syrup may be substituted for those of the orange flowers. *Magendie.*

* Clinique Médicale, vol. i. Paris, 1823.

† Op. citat.

Pastilli emetiæ pectorales.

Pectoral lozenges of emetia.

R. Emetiæ colorat. gr. xxxij.

Sacchar. ℥iv.

Mucilag. q. s. ut fiant pastilli, pond. gr. ix. sing.

These lozenges are commonly coloured red, to distinguish them from those of ipecacuanha. A little carmine may be added for this purpose.

Given in cases of *catarrh*, *hooping-cough*, *chronic diarrhœa*, &c.

Dose. — One lozenge occasionally.

Magendie.

Pastilli emetiæ vomitorii.

Emetic lozenges of emetia.

R. Emetiæ colorat. gr. xxxij.

Sacch. ℥ij.

Mucilag. q. s. ut fiant pastill. pond. gr. xvij. singul.

Dose. — One of these lozenges, taken fasting, is generally enough to make a child vomit: three or four are required for an adult.

Magendie.

Mistura emetiæ purificatæ vomitoria.

Emetic mixture of purified emetia.

R. Emetiæ purif. — in pauxil. acid. nitr. solut. — gr. j.

Infus. flor. tiliæ, f. ℥iij.

Syrup. althææ, f. ℥j. M.

Dose. — A dessert-spoonful to be given every quarter of an hour, until vomiting is induced.

Magendie.

LXIII. ER'GOTA.

SYNONYMES. *Secale Cornutum*, *Clavis Secalinus*, *Calcar*, *Secalis Mater*, *Secale Luxurians*, *S. clavatum*, *Ustilago*, *Clavis Siliginis*, Spurred Rye, Corned Rye, The Spur, Ergot, Hornseed.

French. Seigle ergoté, Blé cornu, Clou de Seigle, Mère de Seigle, Bled avorté, B. farouche, Faux Seigle, Seigle cornu ou corrompu; *S. à eperon*, *S. ergotisé*, *S. ivré*, *S. noir*.

German. Mutterkorn, Gebärpulver, Afterkorn, Schwarzkorn, Aetzroggen.

The effects, which this substance is capable of exerting on the uterus, are so well known as not to need any lengthened description. Its employment in parturition having been revived in this country, there are but few who are ignorant of its reputed properties. Certain other effects have, however, been ascribed to it, in very recent times, which require mention.

Spurred rye or ergot — the latter being the common name from its “spurred” appearance* — is generally considered to be the result of a disease in rye, occurring most frequently when a hot summer succeeds a rainy spring.†

Decandolle, however, regards it as a parasitic fungus, and calls it *Sclerotium clavus*; whilst Leveillé esteems it to be a fungus giving a coating to the diseased grain — the medical virtues residing in the coating. This fungus he calls *Sphacelia segetum*. Brande refers it to the Natural Order Fungaceæ, and terms it *Spermoëdia clavus*, and in the last edition of the London Pharmacopœia, it is referred to the *Acinula clavus* of Fries;‡ but, according to Lindley, Fries has no such plant in any of his works, and the only species of *Acinula* known, *Acinula candicans*, is found on the rotten leaves of the common alder, and among melting snow; its organization is of another kind from that of the *spermoëdia*; and Fries, who regards the other as a morbid state of the grain of certain grasses, considers *acinula* as a true fungus.§

M. Debourge considers, that ergot is an animal product from the telephorous family. The insect deposits a liquid of its own formation on a grain of rye and produces the ergot; whence

* French, *ergot*, “a spur.”

† Dr. Wright, Edin. Med. and Surg. Journ. Jan. 1841.

‡ Syst. Mycol.

§ Brande's Dictionary of the Materia Medica, p. 233, Lond. 1839. See, also, Venus, Grundriss der medicin. Receptirkunst, u. s. w. S. 347. Weimar, 1838; and the opinions of Schreber, De Geer, Parmentier, Buffon, Von Münchhausen, Tessier, Zuckert, Rössig, Hube, Aymen, Robert, Tillet, &c., in Wright, op. cit.

it follows, he conceives, that ergot may be produced at pleasure by expressing this liquid upon all the grains of rye that are within a certain period of their maturity.*

Recently, Mr. Smith† and Mr. Quekett‡ have maintained, that ergot is not a fungus, but a diseased state of the grain occasioned by the growth of a fungus not previously detected: to this fungus the latter gives the name *Ergotætia*§ *abortans* or *Ergotætia abortifaciens*. By the microscope, they discovered sporules, sporidia, or jointed bodies, which appeared to be the reproductive particles of the fungus.

Mr. Francis Bauer,|| however, who has made the ergot a subject of particular study, and who, about thirty years ago, undertook, at the suggestion of Sir Joseph Banks, a series of careful microscopical observations with a view to determine the nature and cause of that singular production, does not consider the question as to the cause of the ergot to be finally and satisfactorily settled. He states, that he is not convinced that the filamentous fungi with numerous sporidia, pointed out by various recent observers, are the cause or the consequence of the ergot: — because, *first* — every gramineous plant is equally infected with that minute filamentous fungus, yet very few of these plants produce ergots; and amongst agricultural grains, the rye is the only one that is subject to the disease; and *secondly*, in autumn all decaying plants are infected with such filamentous fungi and minute sporidia. Mr. Bauer's investigations lead him, however, to determine the ergot to be a morbid condition of the seed.

Ergot is in grains, from a third of an inch to an inch and a half long, and from a line to three lines in diameter, usually curved like the spur of a cock, having commonly two longitudinal furrows, and often irregularly cracked and fissured. Externally, it is of a dingy-purple hue; internally, of a pale grayish-red or grayish-white. Its odour is peculiar, fishy and nauseous; taste obscurely acrid and disagreeable. Unless excluded from the air, it swells and softens, acquiring a deep black colour and heavy smell; and becoming infested by a little acarus, which is about one-fourth the size of the mite of cheese, and destroys the interior of the ergot, leaving the grain as a mere shell. In

* *Sociétés Savantes*, in *Encyclographie des Sciences Médicales*, Avril, 1838.

† *Transactions of the Linnean Society of London*, xviii. Pt. 3, p. 449. London, 1840.

‡ *Ibid.* p. 453, and *London Lancet*, June 22, 1839, p. 465. See also an abridgment of a communication read by Mr. Quekett before the Linnean Society, Dec. 4, 1838, with illustrative woodcuts, in *American Journal of Pharmacy*, for July, 1839, p. 116. For remarks on an insect met with in the diseased grain, see a paper by Mr. Muller, of Butler county, Pa., with comments by Dr. Carson, in *Amer. Journal of Pharmacy* for Jan. 1839, p. 269.

§ From *ergota*, and *aitiz*, "cause."

|| *Transactions of the Linnean Society of London*, xviii. Pt. 3, p. 481. Lond. 1840.

four months, seven and a half ounces of fecal matter of the *acarus* were formed from seven pounds of ergot.* The powder becomes quickly damp, and full of animalcules. It ought, therefore, to be fresh: certainly it ought not to be kept for a longer period than two years.

It has been proposed, lately, to dip the dried ergot in a concentrated solution of gum Arabic; to dry this on a plate of white iron; and when it is dry, to repeat the process two or three times; keeping it afterwards in a well stopped bottle.†

As it is important to judge between a good and bad specimen of ergot, Dr. Wright remarks,‡ that if it be clear and smooth on the surface; not powdery; of a deep purple colour; neither entirely black nor light brown; having a full strong odour; breaking clearly; exhibiting a pink blush interiorly; unpunctured by insects; burning with a clear jetting flame, and being of a less specific gravity than water, its activity may be trusted.

It has been affirmed recently, as the result of actual trials, that ergot picked from growing rye is much more powerful than that which is gathered on the barn floor after the grain has been threshed.§

EFFECTS ON THE ECONOMY.

The effects produced on the animal economy by ergot, when eaten as food, are extremely injurious: the aggregate of the symptoms has been termed *Ergotism*. At times, they are limited to vertigo, spasms, and convulsions, with a peculiar tingling or formication in the arms and legs, which has given the affection the name among the Germans of *Kriebelkrankheit*, or “creeping disease.” Most commonly, the limbs waste away, lose sensation and the power of motion, and separate from the body by dry gangrene — constituting *gangrenous erethism* or *mildew mortification*.|| These, however, are the toxic, not the therapeutic effects of the agent.¶

The extraordinary property, ascribed to ergot, of assisting the parturient efforts, has long been credited in Germany. Its old

* Pereira, Elem. of Mat Med. and Therap. ii. 916. Lond. 1842; or Amer. Edit. by Dr. Carson, Philad. 1843.

† M. Martin, Journ. de Chim. Med. Avril, 1841.

‡ Edinb. Med. and Surg. Journ. Oct, 1839, p. 296.

§ Böttcher and Kluge, cited by Christison, Dispensatory, p. 414. Edinb. 1842.

|| See articles, *Convulsio cerealis*, and *Ergotism*, in the Author's Medical Lexicon, Philad. 1843; also, his Therapeutics, p. 272, Philad. 1836; and his General Therapeutics and Mat. Med. ii., 196. Philad. 1843.

¶ See Christison on Poisons, 3d. edit. chap. xl. Dr. Wright, op. cit. p. 307, and Jan. 1840, p. 9.

German names, *Mutterkorn* ("wombgrain") and *Gebürpolver* ("parturient powder," *pulvis ad partum*), are sufficient evidences of this notion; but, for a long time, this was rather a matter of popular than of scientific belief, although the "*pulvis parturientis*" of the Marburg Pharmacopœia consisted principally of ergot.*

About thirty-six years ago, it was recommended in this country by Dr. John Stearns, of Saratoga county, New York, and since that time the weight of testimony adduced in its favour on both sides of the Atlantic has been overwhelming. Still there are many distinguished individuals, who deny it all power over the uterus both in the unimpregnated and the impregnated state, and who affirm, that it acts only indirectly on that viscus through the general disturbance it occasions, and that, therefore — like every other internal agent administered as an abortive — it ought to be esteemed rather indirect than direct in its action. Such is the decided opinion of Jörg,† whose attention has been directed to the effects produced by different medicinal agents on the sound and diseased economy, and who goes so far as to affirm, from his experiments and observations, that there is no "farther connexion between these degenerate grains and the uterus, than the word *Mutter* ('uterus') which is common to both."

From his various and varied experiments, Dr. Jörg infers, that ergot, when given in small doses, produces little or no effect upon the functions; but that when fresh dried in an oven, and administered in large doses, it oppresses the stomach, occasioning nausea, vomiting, colic, liquid evacuations, destroys the appetite, and injures the digestive powers; these effects being accompanied by a sense of weight in the head, vertigo, cephalalgia, and by general torpor of the system. Under these circumstances, he thinks, it is not difficult to understand, that the connexion between the fœtus and the uterus may be modified, and that abortion may take place.

The author has caused various experiments to be instituted on the use of ergot in doses of half a dram and a scruple of the powder, and in the form of the oily matter referred to below. These experiments were made on both males and females; and the general effects were those described by Dr. Jörg; — when the dose was too large, nausea or vomiting often resulted, with signs of narcosis. They were made, at the author's desire, by

* Dr. Wright, op. cit. p. 22.

† Dass der Gebrauch inner Reizmittel zur Beförderung der Geburt des Kindes unnöthig, fruchtlos, und gesunden Frauen sogar schädlich sei; u. s. w. S. 40. Zeitz. 1833. See, also, Pereira, op. cit. p. 919, and M. Bonjean, in Rapport de MM. Bussy, Pelletier, Dubail, Fremy père et F. Boudet, in Journ. de Pharmacie, Février, 1812, p. 175.

Drs. Cottman and McKee, at the time, resident physicians at the Philadelphia Hospital.* A case of narcosis, produced by this drug, in the dose of thirty grains — administered for the purpose of restraining a real or supposed tendency to hemorrhage after the expulsion of the placenta — was communicated to the author by Dr. Beckwith, of Raleigh, North Carolina.†

When examined by the microscope, its internal structure is found to consist of minute roundish cells, many of which contain particles of oil. The bloom seen, at times, on its surface, seems to be composed of the sporidia of the fungus, to which it is believed by many to owe its origin.‡

Chemical analysis has thrown no light on the cause of those properties. According to the analysis of Vauquelin,§ ergot contains a colouring matter of a yellowish hue; a white oily matter; a violet-colouring matter insoluble in alcohol; a free acid, which is in part phosphoric; a very abundant vegeto-animal matter, which is greatly disposed to putrefaction, and furnishes much thick oil and ammonia on distillation; and a small quantity of free ammonia, which may be obtained at the temperature of boiling water.

A more recent analysis has been made by Maas,|| of Hamburg. He found it to contain gluten; ammonia or a peculiar alkali; acetic acid; a violet-colouring matter; resin; fixed oil; an alkaline acetate; but neither starch, hydrocyanic acid, narcotina, nor phosphoric acid, which some had discovered in it.¶

Ergot has likewise been analysed by Bonvoisin, Pettenkofer, Winkler, Robert, Wiggers,** and others. The analysis of the last gentleman is very elaborate. The results were, — a thick white oil, 35.000; white fatty matter, 1.0456; cerin, 0.7578; fungin, 46.1862; *ergotin*, 1.2466; osmazome, 7.7645; sugar, 1.5530; gum, extractive and colouring matter, 2.3250; vegetable albumen, 1.4600; phosphoric acid and phosphate of potassa, 4.4221; phosphate of lime and traces of iron, 0.2922; silica, 0.1394. Dr. Wright's†† analysis furnished him with the follow-

* Dunglison's Amer. Med. Intelligencer, Sept. 1, 1839, p. 161. See, also, M. Cordier, in Journ. Gén. de Méd. Avril, 1823, and Dr. C. T. De Gravina, in Annali Universali di Medicina, Ottobre, 1839, and Brit. and For. Med. Rev. Oct. 1840, p. 555.

† Dunglison's Amer. Med. Intel. Oct. 15, 1839, p. 213. See, also, Trousseau and Pidoux, Traité de Thérap. i. 546, Paris, 1837.

‡ Christison, Dispensatory, p. 411. Edinb. 1842.

§ Mémoire du Muséum, iii. 198, Paris, 1817.

|| Bulletin des Sciences Médicales de Ferrussac, xix. 332; and Mérat and De Lens, Dict. de Mat. Med. Art. Ergot.

¶ For Mr. Battley's Analysis, see Lond. Med. Gaz., Feb. 1831, and for that of Wigger's, Lancet, Nov. 10, 1832, from Allgem. Med. Zeitung.

** Wright, Edinb. Med. and Surg. Jour. Oct. 1839, p. 298.

†† Op. cit.

ing constituents and their proportions in 100 parts of ergot; thick white oil, 31.00; osmazome, 5.50; mucilage, 9.00; gluten, 7.00; fungin, 11.40; colouring matter, 3.59; fecula, 26.00; salt, 3.10; loss, 3.50. Ergot appears to him to differ from sound rye, chiefly in the presence of oil, osmazome and fungin.

Dr. Samuel Wright* gives the following process for preparing it. Digest ergot in liquor potassæ, at a temperature of from 120° to 150°, until a perfect saponaceous mixture is formed. The liquid must then be diluted with half its weight of water, be accurately neutralised by sulphuric acid, and submitted to distillation from a saltwater or oil bath. The product is white, adhesive, and fatty looking, almost free from empyreuma, and nearly tasteless. The readiest and best, but most expensive mode of obtaining it, is to pass ether through ergot in fine powder by the process of displacement. By allowing the ether to evaporate spontaneously, the oil of ergot is left in its purest form.†

Dr. Wright considers this oil to be the active matter of ergot; and he states — as the result of positive experiment — that it has the same effect in inducing powerful uterine contractions as ergot itself.

Dr. Hooker, of New Haven,‡ found, that when a quantity of pulverised ergot was macerated for several days in sulphuric ether, and the liquid evaporated in a glass vessel until it no longer afforded the smell of ether, there remained at the bottom of the vessel a small quantity of thick heavy oil, resembling in appearance fish oil; above this was a lighter oil, much more abundant than the former, of a light reddish-brown colour, and of a sweetish nauseous taste. This light oil was found to be possessed of decidedly narcotic properties. In two experimental cases, the effects of ergot continued apparent for nearly a week; the pupils of the eye were dilated; the pulse, respiration, and capillary action were very slow, and the skin livid, — with loss of appetite, general languor and lassitude, and rigidity and soreness of the muscles; those of the thighs and other parts of the lower extremities being more particularly affected. For three days, the pulse continued below fifty, with a proportionate infrequency of respiration.§

In the experiments made with this substance by Dr. McKee,|| he found that in every case, when given in doses of from ten to forty drops, it at first produced slight exhilaration of the spirits with increase of circulation; but these symptoms were soon followed by sedation, and in the larger doses by nausea also.

* Edin Med. and Surg. Journal, July, 1840.

† A. Duhamel, Amer. Journal of Pharmacy, July, 1841, p. 95.

‡ Boston Med. and Surg. Journ., x. 298, Boston, 1837.

§ See Dunglison's Amer. Med. Intelligencer, Dec. 15, 1837, p. 329.

|| Ibid. Sept. 1, 1839, p. 161.

More recently, an ethereal solution has been prepared by Dr. Rees, by digesting four ounces of powdered ergot in four fluid ounces of ether for seven days. The ether dissolves the fatty matters contained in the drug. It is then poured off, evaporated to dryness, and the residue again dissolved in two fluid ounces of ether. Repeated trials of this preparation have been made by Mr. J. C. W. Lever,* who affirms, that it acts most powerfully on the parturient powers of the uterus during and after labour. What is singular, — Mr. Lever remarks, — whilst all the other preparations of ergot not unfrequently produce acro-narcosis, he has not once seen these symptoms supervene on the use of the ethereal solution. He thinks they are most probably caused by some constituent of the drug, which ether does not dissolve, — a view which cannot be reconciled with the results of the experiments detailed above.

Each ounce of the preparation, Dr. Rees thinks, may be considered equivalent to two ounces of ergot; or fifteen drops to a half dram dose of the powdered drug. Mr. Lever gave it in doses varying from fifteen drops to thirty, dropped upon sugar, and he found that uterine action commenced in twenty minutes or half an hour.

Although ergot is capable of producing the acro-narcotic effects described above, their supervention is not desired by those, who regard it to be possessed of peculiar powers by which it causes contraction in the uterine fibres of the parturient female, and who administer it with that view. When given in appropriate and properly repeated doses, the uterine action, they assert, becomes more energetic, and the contractions constant and almost unremitting; but there is no accompanying disorder. Cases are on record† in which it has appeared to induce rupture of the uterus, where the obstacles to delivery were invincible. It has been largely administered, and in no country, perhaps, more than in this: practitioners of the greatest eminence — here and elsewhere — have placed the fullest reliance on its powers to excite contraction of the uterine fibres, and although in many of the cases which fell under their observation, the parturient efforts might have recurred without the agency of the ergot, this could scarcely have been the case with the remainder. From the results, therefore, of these cases, we seem to be compelled to admit, that ergot is possessed of expulsive properties by which it acts upon the parturient uterus; but that it is capable of producing any effect upon the unimpregnated uterus, or upon the impregnated, at any time, except

* Lond. Med. Gazette, Apl. 10, 1840, p. 108.

† M. Delmas, *Journal de Médecine de Montpellier*, and *Journal de Pharmacie*, Juin, 1842, p. 546.

when parturition has commenced, is denied by many. It has been lately affirmed, indeed, that in the neighbourhood of Trois Croix, in France, there was, during the season of 1841, an epizootic abortion amongst the cows, which had caused much consternation with the farmers; and that M. Bodin,* director of the school of agriculture, had discovered, that the grains of rye, and of many other of the gramineæ contained a considerable quantity of ergot. This he concluded was the cause of the epizootic. On the other hand, the experiments of Dr. Wright,† and of Dr. De Gravina,‡ seem to exhibit the singular fact, that ergot appears to have the power of *prolonging* gestation in the guinea pig and rabbit, when administered for a considerable period.§ The result of all observations precludes the belief, that the increased parturient efforts, resulting from its agency, are produced indirectly by violence done to the constitution of the mother, inasmuch as, in most of the recorded cases of benefit accruing from its administration, no such violence would appear to have been perpetrated. Yet, admitting the full power ascribed to ergot in these cases, it can be rarely necessary to have recourse to it; and it is doubtless often employed, where the propriety of the administration of it, or of any other agent, is extremely questionable. A recent writer, who places the discovery of its powers in the same rank with that of the vaccine virus, states, that he has administered it in 1500 cases!!

But the effect produced by ergot upon the mother has not been the only topic of interest in regard to its use in parturition. It has been maintained by many, that since its introduction, the number of the still-born has augmented, and that observation has sufficiently shown, that where it is given to expedite delivery, more or less danger always accrues to the offspring;¶ either by the induction of asphyxia, or of positive death, owing to the violence of the uterine contractions, or by the deleterious agency of ergot on the fœtus.** But even were we to admit its prejudicial effect on the fœtus in utero to be true—and it has been deposed to by many obstetricians—and that the number of the still-born is greater than formerly—which, however,

* Journal de Méd. et Chirurg. Pratiq. Oct. 1841.

† Op. cit.

‡ Op. cit.

§ Brit. and For. Med. Rev. Oct. 1840, p. 556.

¶ H. Wardleworth, Essay on the Chemical, Botanical, Physical, and Parturient Properties of the *Secale Cornutum*. Lond. 1840.

¶ Chevasse, in Transact. of the Provincial Med. and Surg. Association, iv. 306, Lond. 1836. Prof. R. M. Huston, North Amer. Med. and Surg. Journ. 1829; and Mr. Chatto, in Lond. Med. Gaz. July 13, 1839, p. 575; also, Reports of Med. Society of London, in Lancet, Oct. 26, 1839, p. 168, and Mr. Wright, Edinb. Med. and Surg. Journ. Jan. 1840, p. 25.

** Mojon, in Gazette Méd. de Paris, Janv. 19, 1839.

appears to be by no means the case — its influence could be but small, and could not account for the statistical differences that have been noticed.*

Mr. Braithwaite† affirms, that in order that ergot should act perniciously on the child, it is necessary that its action on the uterus should be uninterrupted. He has seldom or never seen any bad effects on the child when the patient had some rest between the pains.

In many cases, ergot has been largely administered, and yet the child has been born alive. Dr. James Patterson,‡ of Glasgow, details the particulars of a case in which the enormous quantity of four ounces was given, yet the movements of the child continued lively; and he refers to an excellent paper by Professor Von Busch,§ of Berlin, now before the author, which contains a reference to one hundred and seventy-five cases, in which it was given on account of deficient labour-pains. One hundred and seventy-seven children were born; of these, one hundred and forty-two were born alive; eighteen in a state of asphyxia, which was removed by appropriate treatment; and seventeen still-born. Of the seventeen dead, seven had evidently died before labour, and were more or less putrid; and ten, during labour; of these, two lost their lives from turning; one from presentation of the breech; two from prolapsus of the funis; one from narrow pelvis and detention of the head therein; one from the long duration of the fourth stage of labour; one from a difficult forceps case, which required perforation afterwards; one from a peculiar deformity of the extremities; and one from no assignable cause: so that, of the one hundred and seventy-seven cases, there was but one which could be referred to the agency of the ergot, and there was no reasonable ground for such reference.

A recent writer|| is disposed to think, that ergot, improperly administered, produces puerperal convulsions as a remote effect, — that it gives rise to the hour-glass contraction; and that it gives a predisposition to hydrocephalus in the early stage of infantile life! The chief or only cases in which Dr. Catlett seems to think it admissible, are when there is serious hemorrhage owing to detachment of the placenta, accompanied by deficient uterine

* Avery, in *Transact. of the Med. Society of the State of New York*, vol. iii. Pt. 2, p. 185, Albany, 1837.

† *Retrospect of Pract. Med. and Surg.* vol. i. No. 1, p. 181, 3d ed. Lond. 1842.

‡ *London Med. Gaz.* June 1, 1839, p. 337. See, on this subject, Dr. E. Warren, *New England Quarterly Journal of Medicine and Surgery*, July, 1842, p. 10.

§ *Die gebürtshülftliche Klinik an der königlichen Friedrich-Wilhelms-Universität zu Berlin, in neue Zeitschrift für Geburtskunde, u. s. w. B. v. H. i. S.* 107. Berlin, 1837.

|| *Dr. Catlett, Edinb. Med. and Surg. Journ.* Jan. 1842.

tone; and, in the latter stage of labour, in checking hemorrhage from whatever cause.

Dr. Frank Ramsbotham,* who regards ergot as capable of exerting specific powers on the uterus at all periods of utero-gestation, and who has referred to several cases of premature labour, induced in his own practice by its use, is disposed to conclude, that although it may bring on labour without having recourse to any operation, yet that it does not present a more likely, or indeed so probable a means of saving the infant as the older method of puncturing the membranes; and he infers, from his experience, that whatever might have been the quantity administered, unless it exerted a decided influence over the uterus, the child suffered no detriment.†

Dr. Paterson‡ and Mr. Heane§ have likewise administered ergot successfully in large doses with the view of *inducing premature labour*. The former of these gentlemen is disposed to think, that its abortive properties are not exerted upon the impregnated uterus at an early period of utero-gestation, but that, at a certain stage of development, the uterine fibres are capable of being excited by it so as to expel the fœtus. It would be strange were its agency to be thus restricted.

When ergot was found to be possessed of the power of *exciting uterine contractions*, it was philosophical to employ it in *retention of the placenta*, in *after-pains*,|| and in cases of *uterine hemorrhage*, and of *convulsions*¶ in the *parturient state*, accompanied by atony of the uterus.** In such cases, means of more speedy action are needed; but still, cases might arise in which the administration of ergot might be serviceable, and several such, attesting the services rendered by it, have been published.

It has been strongly recommended, likewise, for the *prevention of uterine hemorrhage* by Stearns,†† Dewees,‡‡ Bradley,§§ Abraham,||| Kisch, Trousseau,¶¶ and others.

In a case of copious *hemorrhage from the uterus connected*

* Lond. Med. Gaz. June 15th, 1839, p. 420. See, also, Ibid. for June 28, 1834.

† See, on this subject, Dr. J. J. Kelso, in Lond. Lancet, June 22, 1839, p. 462; and Duparcque, in Revue Médicale, Mars, 1838.

‡ Lond. Med. Gaz. June 1, 1839, p. 332. See, also, Ibid. Sept. 1838.

§ Ibid. Jan. 26, 1839. For various opinions on this subject, see Mr. Wright, in Edinb. Med. and Surg. Jour. Jan. 1840, p. 27.

|| Hoffman, in Berl. Med. Zeitung, June 29, 1836.

¶ Duparcque, Revue Méd. Mars, 1838.

** Von Busch, Op. cit. i. 105.

†† Philad. Journ. of Med. and Phys. Science, v. 44.

‡‡ System of Midwifery.

§§ Lancet, April 15, 1837.

||| Ibid. April 22, 1837.

¶¶ Journal des Connoissances, 1839.

with *polypus*, Mr. Moyle* administered two drams of the tincture of ergot, which was repeated at intervals, with the effect of inducing uterine contraction and the expulsion of the polypus, "which equalled in size two large placentæ." Mr. Moyle was equally successful in a similar case.

Other cases in which the effect of the ergot was to force down the *polypus* so that a ligature could be applied to it, have been related by Dr. Somerville and Dr. McFarlane.†

The employment of ergot has been extended to *amenorrhœa*,‡ and *dysmenorrhœa*, and to *uterine hemorrhage in the unimpregnated female*, and many cases have been published in confirmation of its being possessed of such virtues.§ It was thought, also, that it might be serviceable, — and was found so by Bazzoni,|| Negri, Langlet,¶ and others, — in *leucorrhœa*, and in *gonorrhœa*,** *dysentery*,†† &c. ; and again, as it proved to be useful in uterine hemorrhage, it was conceived, that it might exhibit like powers in *other hemorrhages* ; and, accordingly, it was given in cases of *epistaxis*, *hæmoptysis*, *hæmatemesis*, *hæmaturia*, &c. In these last cases, it has been rarely employed.‡‡ It is proper to observe, however, that the author has often administered it in such cases, but has never had reason to believe, that it exerted any efficacy ; and such has been the case with MM. Trousseau and Pidoux,§§ Dr. Pereira,||| and others.¶¶ The narcotic or sedative property, which it exhibits in certain cases and doses, and the sedative action, which it exerts in others, may render it serviceable in these affections, whatever

* Lond. and Edinb. Monthly Journal of Med. Science, June, 1841.

† Ibid. Aug. 1841.

‡ Enriotti, in Repertorio Medico-Chirurgico del Piemonte, and Journal des Connoissances, Mars, 1838. Langlet, Bulletin Médical Belge, Juin, 1839, p. 125. Dewees, Midwifery, chap. Amenorrhœa ; Locock, Cyclop. of Practical Medicine, i. 70. Nauche, Nouveau Dict. de Méd. et Chirurg. art. Ergot ; and Mr. Wright, in Med. and Surg. Journ., Jan. 1840, p. 34. See, also, Churchill (with whom it failed), Diseases of Females, Dunglison's Amer. Med. Library edit. p. 54. Philad. 1839 ; Dr. G. Fyfe, Med. Gazette, June 18, 1841.

§ Dr. G. Fyfe, Op. cit.

|| Annali Universali di Medicina, Feb. 1831 ; and Ryan, Medical Formulary p. 264, 3d. edit. Lond. 1839.

¶ Op. citat.

** Müller in Rust's Magazine, B. xl. H. iii. and Amer. Journ. of the Med. Sciences, Feb. 1835, p. 527 ; Ryan, Op. cit. and Desruelles, Gazette des Hôpitaux, Juin 2, 1842.

†† Mojon, Op. cit.

‡‡ Duparcque, Op. cit., and De Gravina, Annali Universali di Medicina, Ottobre, 1839.

§§ Traité de Thérap. i. 546. Paris, 1837.

||| Elem. of Mat. Med. and Therap. ii. 925. Lond. 1842.

¶¶ See the Author's General Therap. and Mat. Med. ii. 197, Philad. 1843.

may have been the process of reasoning, which led originally to its employment.*

The experiments of Dr. De Gravina† led him to the inference, that ergot is a direct sedative, like digitalis, and hence he considers it a good antiphlogistic remedy, and well calculated to lower the vital powers.

Dr. Wright‡ affirms, that when applied to an abraded surface, it gives rise to profuse sloughing. He tried it upon wounds nearly healed, and in less than 24 hours they discharged purulent matter abundantly. The matter was generally of an offensive character; and the wounds, thus treated, even under the application of proper curative means, were long and tedious in healing. In the form of powder, he found it very serviceable in arresting *hemorrhage*; and not simply in a mechanical manner, as was proved by experiment. Even in the form of infusion, it possessed the power in an extraordinary degree. Müller divided the popliteal artery in the sheep, and completely arrested the bleeding by lint dipped in an infusion of ergot. The caudal artery, and the anterior crural artery of a horse were cut, and the bleeding was similarly subdued. Dr. Wright says, that he has several times divided the external jugular and the saphena major veins, and has never failed to arrest the hemorrhage by an infusion of ergot, although with arteries he has been generally less successful. In the greater number of his experiments, he used a dilute solution of ergot, in the place of warm water, to sponge the bruised parts, and always succeeded in preventing that continued flow of blood, which is often a serious obstacle to the safe direction of the knife. He consequently recommends it as a valuable means of preventing the troublesome hemorrhage from small vessels in the course of surgical operations; and upon the same principle he believes the injection of a similar solution into the uterus, in cases of flooding, will be found to answer every practical end that can be desired.

In a severe case of *epistaxis*, Dr. Wright§ arrested the hemorrhage by injecting up the nostrils equal parts of very dilute spirit and of oil of ergot; and he has little doubt, that in the severe cases of uterine hemorrhage, that follow delivery, the injection of the oil diffused through water into the uterus would be productive of the happiest results. It proved also serviceable in arresting hemorrhage after the extraction of a tooth and from leech-bites.

Dr. Wright found the oil a valuable external application in

* See some remarks on this subject, by the Author, in his *Amer. Med. Intel.* vol. i. p. 219.

† Op. citat.

‡ Op. cit., Jan. 1840, p. 20.

§ Edinb. Med. and Surg. Journ. July, 1840.

cases of *local rheumatism*. In three instances it was entirely successful. The affected part was well rubbed with it for a quarter of an hour night and morning, until relief was obtained. He states farther, that it is one of the most valuable remedies with which he is acquainted in *toothach*. He has repeatedly known it subdue the pain when creasote had failed.

By Lisfranc,* the powder was employed, in the dose of from two to eight grains, in cases of *hypertrophy of the uterus* of various kinds, whenever reduction of the organ to a less size seemed to be the prominent indication; and Dr. Perrinet† has published some cases of *periodical diseases*, in which it was administered with advantage during the intervals; but no further results appear to have been elicited.

M. Payan‡ thinks it demonstrated, that ergot is primarily and essentially an excitant of the spinal marrow; and he conceives, that its action on the uterus, bladder, and muscles of the lower extremities is but secondary, from a reflex action transmitted from the spinal marrow to those organs through the nerves distributed to them. He has given the details of some cases of *paraplegia*, which seemed to be relieved by ergot; an infusion of fifteen grains in water being given at first in the course of the day, and the dose being gradually augmented.§

M. Allier, fils,|| from having observed, as he believed, contraction of the fibres of the bladder under the administration of ergot, has recommended it highly in cases of *retention of urine*; and feels himself justified in inferring, from the results of varied observation, that it is capable of restoring to the bladder the contractility it may have lost owing to immoderate distension of its coats by accumulation of urine; — that its action has been evinced in cases in which this kind of paralysis has resisted all known therapeutical agents; and that, owing to the fugacious character of its operation, it ought to be administered at short intervals, in broken doses, and these should be long continued.

M. Allier recommends, that it should be commenced in the quantity of a scruple in the day, divided into six equal parts, that the quantity should be afterwards raised to forty grains, and then gradually diminished to a scruple; and afterwards discontinued by degrees in eight or ten days after the cure, in order to consolidate it.

Lastly, — In the *Annales de la Société de Médecine de Gand*,

* Pauly's Lisfranc, translated by Dr. Lodge, p. 330. Boston, 1839.

† Amer. Journ. of the Med. Sciences, Nov. 1833, p. 279.

‡ Revue Médicale, Février et Mars, 1839; and Encyclograph. des Sciences Médicales, Avril, 1829; also Journal de Pharmacie, Juin, 1842, p. 545.

§ See, also, Pétrequin, Bulletin de Thérapeutique, Mars, 1840.

|| Journal des Connoissances Médico-Chirurgicales, Nov. 1838.

M. Guersant* has published two cases in which he administered ergot with the greatest advantage to effect the *expulsion of fragments of calculi*, after the operation of lithotrity. Twenty-four grains were first given in three doses during the day, but no effect having been produced, the dose was increased to thirty grains in the day, when the patient experienced frequent desire to pass the urine, followed by pain in the hypogastric region, pricking in the limbs, and slight derangement of vision. After using the medicine for five days, fragments of calculi were passed, and, during twenty-four hours, in three times the quantity that had been discharged during the whole previous period subsequent to the operation.

MODE OF ADMINISTERING.

The great difference that has been observed in the effects of ergot has led to the belief, that there must be much difference in the article, and that every care must be taken to have it good. Dr. Ryan,† indeed, affirms that not one druggist or chemist in a hundred has it genuine.

It must be recently pulverised, too, if we are desirous to count upon its action when given in this form.‡

When prescribed with the view of augmenting the parturient energy, it is most commonly perhaps given in powder, in the dose of from ten to twenty grains, repeated every twenty minutes until the effect upon the uterus is elicited. Professor Von Busch§ found the best results when it was given in the dose of ten grains at short intervals — from ten to fifteen minutes. In one case it was requisite to repeat it eight times; in four cases, six doses were sufficient; in twelve, five; in thirty-three, four, and in the remainder of the one hundred and seventy-five cases, three and less: the smallest quantity exhibited was a single dose of ten grains; the largest, nine doses of ten grains. Dr. Ryan|| says the maximum dose is a dram and a half; but it, obviously, cannot be thus limited.

Dr. Hooker, who considers, that the ecboic and the narcotic properties of ergot may be separated, recommends, in these cases, the clear infusion, which possesses, he conceives, the former property only. The powder of course contains both.

Dr. Bishop, of New Haven,¶ asserts, that he has never seen

* Journal de Médecine et de Chirurg. Pratiq. November, 1839.

† Formulary, p. 264.

‡ Allier, Op. cit.

§ Op. cit. S. 106.

|| Op. cit.

¶ Dunglison's Amer. Med. Intelligencer, Dec. 15, 1837, p. 330.

but once any unpleasant effects from the use of ergot, and then he gave it in powder: the labour was protracted and narcotism induced. In New Haven, it is the general practice to administer the infusion, and in that form it is considered safe and effective in parturition. It is not easy, however, to see how the fixed oil can be taken up by hot water.* The infusion is termed in France, "*Thé de Seigle noirci des sages-femmes Américaines!*"† Recently, the sedative properties of ergot have been affirmed to exist in the aqueous extract, which has been given in the dose of from 15 to 30 grains in hemorrhage.‡

It is proper, however, to remark, that the form of infusion as well as of decoction was found by Dr. Jürg to be highly unpleasant to the stomach, and it could not be repeated in his experiments — which, it must be remembered, were not made on the parturient female — in large doses for any length of time, without irritating the bowels, producing loss of appetite, and general impairment of the digestive function.

Dr. Wright,§ recommends the oil of ergot to be given in the dose of 20 to 50 drops in tea, weak spirit and water, some aromatic water, or made into an emulsion with mucilage and syrup. It would seem to be the most advisable form of exhibition, as the oil retains its properties for several years, if kept in well closed bottles excluded from light.

As to the form of tincture, Mr. Battley affirms, that alcohol will not extract the active property, and Dr. Ryan|| states, that he has certainly found the tincture to fail in the majority of cases. Mr. Battley prefers the watery extract.

For the purpose of inducing premature labour, it has been necessary to give it in larger doses. Dr. Paterson¶ gave it in the form of the infusion, p. 263, until the patient took six drams of the medicine. The infusion was likewise given by Dr. F. Ramsbotham,** and the quantity which each of his patients took varied from two to twelve drams.

When the ergot is given with other views, the usual dose is 10 or 15 grains of the powder, three or four times a day: the results of the observations of Dr. Cottmant†† have shown, however, that in 30 grain doses its sedative effects are more marked. This, too, was the dose in which it was administered by Dr. Hooker. In such cases, the tincture, and the light oil described

* See the Author's General Therapeutics and Materia Medica, i. 427. Philad. 1843.

† Journal de Pharmacie, Février, 1842, p. 177.

‡ Bonjean, in Rapport cit.

§ Edinb. Med. and Surg. Journ. July, 1840.

|| Op. cit. p. 266.

¶ Lond. Med. Gaz., June 1, 1839, p. 333.

** Ibid. June 15, 1839, p. 421.

†† Dunglison's American Med. Intelligencer, Sept. 1, 1839, p. 161.

by Dr. Hooker, may also be prescribed;—the latter in the dose of ten to thirty drops.

Infusum ergotæ.

Infusion of ergot.

R. Ergot. ℥j.
Aquæ bullientis, f.℥iv.

Infunde.

Dose. — One third, to be repeated every 15 or 20 minutes, in *deficiency of uterine contractions.*

R. Ergot. ℥ss.
Aquæ bullientis, f.℥xxiv.

Colaturæ adde

Syrup. simpl. f.℥j.

Dose. — Two ounces every three or four hours, to *induce pre-mature labour.*
Paterson.

R. Ergot. ℥ss.
Infunde per semihoram in
Aquæ bullientis, f.℥iss. et cola.

This quantity to be taken for a dose, and repeated every four hours.
F. Ramsbotham.

Decoctum ergotæ.

Decoction of ergot.

R. Ergot. ℥j.
Aquæ, Oijss.
Coque ad Oij. et cola.

Dose. — A table-spoonful every quarter of an hour.

Tinctura ergotæ.

Tincture of ergot.

R. Ergot. ℥ijss.
Alcohol. dilut. Oj.
Macera per dies quatuordecim et cola.

Dose. — Twenty minims to two drams, two or three times a day, as a sedative agent.
Guy's Hospital.

Syrupus ergotæ.

Syrup of ergot.

(Sirop de Calcar. — Desgranges.)

R. Ergot, gr. xx.
 Extract. opii, gr. $\frac{3}{4}$.
 Syrup. f. ℥ viij. M.

Dose. — Two table-spoonfuls (one ounce) in cases of *engorgement of the uterus*. *Lisfranc.*

Pulveres ergotæ compositi.

Compound powders of ergot.

(Antihemorrhagic powders. — RYAN.)

R. Ergot. ℥ ss.
 Pulv. aromat. ℥ ss.
 Sacch. ℥ ss.

M. et divide in chartulas. x.

Dose. — One, every hour or every second or third hour, in *active hemorrhage* from any outlet. In *leucorrhæa* and *gleet*, one may be given three or four times a day, and should they fail the following may be substituted.

R. Ergot. pulv. ℥ ij.
 Cubeb. pulv. ℥ j.
 Pulv. aromat. ℥ ss.
 Sacchar. ℥ j.

M. et divide in chartulas viij.

Dose. — One, three or four times a day.

Ryan.

Pilulæ ergotæ.

Pills of ergot.

R. Ergot. pulv. gr. ix., xij. vel gr. xvij.
 Ext. hyoscyam. gr. i.
 Potass. nitrat. gr. xv.
 Camphor. pulv. gr. iij. M. et divide in pil. xl.

Two to four, every two hours, in cases of *urethritis* of the prostatic or membranous portion of the canal. *Desruelles.*

Vinum ergotæ.

Wine of ergot.

R. Ergot. contus. ℥ij.
Vini, Oj.

Macerate for 14 days, shaking occasionally ; then express, and filter through paper.

Dose. — F.℥j. to f.℥ij.

Pharm. U. S. 1842.

Injectio ergotæ.

Injection of ergot.

R. Ergotæ, ℥ss.
Aq. bullient. Oss.

Used in cases of *erythemoid vaginitis* and *urethritis*.

Desruelles.

LXIV. EUPHOR'BIA LATH'YRIS.

SYNONYMES. Cataputia Minor, Lathyris, Tithymalus Latifolius, Caper Spurge, Garden Spurge, Mole Plant.

The oil of *spurge* — OLEUM EUPHORBIAE LATHYRIDIS — has been recently recommended in medicine. Although the Euphorbia is not a native of this country, it is sometimes met with in situations where it has the appearance of growing wild. It is easily cultivated, and in some parts of New Jersey, where it has been introduced, is found in abundance.*

The oil, obtained from the seeds, resembles in colour the oleum ricini, but is less dense. It has no odour when newly prepared, and no perceptible taste. It is soluble in sulphuric ether, insoluble in alcohol, and forms a soap with the alkalies. Its s. g. is .920.

* Scattergood, in Philad. Journ. of Pharmacy, iv. 124, Philad. 1833. See also, Journ. de Chimie Méd. ii. 178.

EFFECTS ON THE ECONOMY IN DISEASE.

Dr. Charles Calderini found, that, in the dose of from four to eight drops, it acted as a cathartic on the adult, without occasioning colic or tenesmus. In half the quantity, it proved cathartic to children. He gave it in sugared water, or in the form of an emulsion; and was of opinion that it might be advantageously substituted for castor oil, especially for children.

After him, it was employed by M. Grimaud, and subsequently by M. Bally,* who carried the dose as far as ten drops.

Louis Frank† has suggested its employment in cases of *tænia*, *hysteralgia*, *ascites*, &c.

It would appear, from the remarks of Mr. Scattergood, that the oil, obtained from the beans growing in this country, does not possess the mild qualities ascribed to the European article. Six, eight, ten, and twelve drops were given to several individuals as a cathartic; and, although administered in conjunction with aromatic oils, and in one or two cases with an alkali in the form of soap, it invariably produced nausea, and even vomiting. Mr. Scattergood adds, that he has been informed by the manufacturer, Mr. Thomas Bellangee, of Crosswicks, New Jersey, that when administered in small quantities, and repeated at intervals of half an hour or an hour, it operates on the bowels freely as a cathartic, without producing much nausea.

Pichonnier‡ has proposed the following formula for a cathartic mixture.

Mistura olei euphorbiæ.

Mixture of the oil of euphorbia.

R. Olei euphorb. lathyr. gtt. viij.
 Acac. pulv. ʒj.
 Sacchar. ʒij.
 Aquæ destillat. f. ʒiij. M.

* Journal Universel des Sciences Médicales, xli. 254.

† Journ. de Pharm. xi. 273; and Mérat and De Lens, Dict. de. Mat. Méd. iii. 183. Paris, 1831.

‡ Journ. de Chimie Médicale. Paris, 1827.

FERRI PRÆPARATA.

SYNONYMES. Preparations of Iron.

French. Les Préparations de Fer.

German. Eisenpräparate.

LXV. FERRI ARSENIAS.

SYNONYMES. Ferrum Arseniatum, Ferrum Arsenicum Oxydulatum.

French. Arséniate de Fer.

German. Arsensaures Eisenoxydul, Arseniksaures Eisenoxydul.

This preparation has been recommended by Mr. Carmichael,* who often applied it externally in cases of *cancerous ulcers*. Naturally, it presents itself in small, clear, bluish-green crystals, of a regular octaëdral shape, and is called *scorodite*. Artificially, it is formed by double decomposition.

METHOD OF PREPARING.

Glaser gives the following formula for its preparation:—Eight ounces of semivitrified *white arsenic*, sprinkled with a little *spirit of wine* and reduced to fine powder, are mixed with as much *purified saltpetre*. The mixture is then placed in an uncovered Hessian crucible, which should only be half filled with it, and then be placed in a wind furnace. At first, a slight degree of heat is applied, under which the mass soon melts, giving off copious red fumes, the inhalation of which should be carefully avoided. The process had better, therefore, be carried on in the open air, or in a laboratory that has a chimney with a good draft. When the mass no longer gives off red fumes, and flows tranquilly, the crucible must be carefully removed from the fire, the contents be suffered to cool somewhat, and *boiling distilled water* be poured upon them: under active boiling they will dissolve altogether. *Hot water*, sufficient to fill the crucible, is now added, and the whole is allowed to remain at rest for twenty-four hours; at the expiration of which time a considerable quantity of beautiful crystals of acid arseniate of potassa is found on the sides of the crucible. The fluid, holding the salt in solution, is now filtered into a clean porcelain or glass vessel; the crystals are collected, dried carefully in the shade, and put away amongst the poisons as the *Arsenias potassæ acidus*.

* An Essay on the Effects of the Carbonate and other Preparations of Iron upon Cancer, 2d edit. Dublin, 1809.

The fluid, poured from the crystals and filtered, is now diluted with *distilled water*, and a solution of *pure sulphate of iron* added thereto so long as any precipitate is thrown down. The bluish-green precipitate, insoluble in water, is the *ferri arsenias*, which must be collected on a filter, washed and dried in the shade. The process must be conducted with the greatest care, and the vessels used be cautiously cleansed or broken, for fear that mischief may arise. In these chemical operations, the acid of the saltpetre is decomposed by being heated with the arsenious acid or white arsenic, a part of its oxygen is taken by the latter, and arsenic acid is thereby formed, which unites with the potassa of the saltpetre and forms acid arseniate of potassa; the nitric acid being converted into nitrous acid is given off in the form of red fumes: by admixture of a solution of sulphate of iron with the solution of the acid arseniate of potassa, a double decomposition ensues, the result of which is the formation of sulphate of potassa and arseniate of iron, which last, being insoluble, falls to the bottom of the vessel.

EFFECTS ON THE ECONOMY.

According to Carmichael, this preparation acts more powerfully on the vitality of *cancerous formations* than any other agent, and the dead slough caused by it is much deeper than that caused by the application — which was at one time so much celebrated — called "*Plunket's caustic*." He allows, however, that the greatest caution should be observed in its use. Of late, he has employed a compound of arseniate of iron with phosphate of iron; half a dram of the former to two drams of the latter. This mixture must be applied very thin by means of a camel's hair pencil, and not over the whole surface of the ulcer when it is extensive.

MODE OF ADMINISTERING.

The compound, just mentioned, may be applied in the form of ointment, prepared in the following manner:—

Unguentum ferri arseniatis compositum.

Compound ointment of arseniate of iron.

R. Ferri arseniat. ℥ss.
 ——— phosphat. ℥ij.
 Cerat. cetacei, ℥vi. M.

This ointment must be spread on lint and applied to the ulcer.

Werneck gives it the preference over all the usual arsenical preparations. Arseniate of iron has likewise been administered internally in *cancerous affections*. The following formula may be used :

Pilulæ ferri arseniatis compositæ.

Compound pills of arseniate of iron.

R. Ferri. arseniat. gr. iij.
 Extract. gentian. ℥j.
 Glycyrrhiz. pulv. ℥ij.
 Syrup. cujusvis q. s. ut fiat
 Massa, in pilulas xlviij. dividenda.

Dose. — One, three times a day.

LXVI. FERRI BRO'MIDUM.

SYNONYMES. Ferrum Bromatum, Bromated, or Bromide of, Iron ; — in solution, Hydrobromate of Iron, Ferri Hydrobromas.

French. Bromure de Fer.

German. Bromeisen.

METHOD OF PREPARING.

This preparation is made by heating equal parts of *bromine* and *iron filings* under water. As soon as the fluid becomes of a greenish colour, it is filtered, and evaporated to dryness: the reddish residue — again dissolved in water and evaporated — is bromide of iron. It has a brick-red colour ; dissolves readily in water, is deliquescent in the air, and has a very styptic taste.*

EFFECTS ON THE ECONOMY AND MODE OF ADMINISTERING.

Magendie has prescribed it successfully in cases, in which the preparations of bromine have been indicated. (See *Brominum*, p. 107.) He recommends the following formula.

* Magendie, Formulaire pour la préparation, &c., de plusieurs nouveaux médicamens, dernière édit.

Pilulæ ferri bromidi.

Pills of bromide of iron.

R. Ferri bromid. pulv. gr. xij.

Confect. rosæ, gr. xvij.

Acaciæ pulv. gr. xij.

Fiat massa in pilulas xx. dividenda.

Dose. — Two, morning and evening.

Magendie.

R. Ferri bromid. ℥j.

Extract. glycyrrhiz. q. s.

ut fiat massa in pilulas lx. dividenda.

Dose. — One or two, morning and evening, in cases of *scrophula*, and *hypertrophy* — of the uterus especially. *Werneck.*

LXVII. FERRI CARBURETUM.

SYNONYMES. Ferrum Carburetum, F. Carbonatum, F. Supercarburetum;

Graphites, Plumbago, Carbo mineralis, Black Lead, Carburet of Iron.

French. Carbure de Fer, Graphite, Crayon noir, Plombagine.*German.* Kohlenstoffeisen, Graphit, Reissblei.

This well known substance was formerly considered to be slightly astringent and desiccative. By Weinhold,* it has been advised strongly in certain *cutaneous affections*, but although it has been received into various pharmacopœias of continental Europe, as the Antwerp, Bavarian, Brunswick, Spanish, Parisian, Finnish, Prussian, Saxon, and Swedish, it has never been recognised as a therapeutical agent in this country or in Great Britain.

MODE OF PREPARING.

As crude graphite is frequently very impure from the attached matrix, the Prussian Pharmacopœia has a formula for its purification, the product of which bears the name *graphites depuratus*. With this view, the graphite must be very finely pulverised; a

* Der Graphit als ein neu entdecktes Mittel gegen Flechten. Leipz. 1809.

pound of it is boiled in a proper quantity of *common water*, for an hour; the water is then decanted, and two ounces of *nitric acid* and of *muriatic acid*, and eight ounces of *common water* are poured upon the graphite. This mixture is digested for twenty-four hours, frequently shaking it; the acid fluid is then poured off, and, after the residuum has been washed by an appropriate quantity of *common water*, it is dried.

EFFECTS ON THE ECONOMY.

The internal use of graphite produces no perceptible change on the organic functions, except that, according, to Weinhold, under its protracted use, the urinary secretion is augmented, and a disposition to micturition excited. He found, however, that in *herpetic* and *other cutaneous affections*, it occasioned a very favourable modification in the eruption, and wholly removed it. In consequence of the results of his observations, he published a monograph in which he recommended it to physicians in those diseases. He employed it as well internally as externally. The urine, he asserts, after its administration, commonly began to make a deposite, and this continued until some change in the cutaneous affection announced its approaching cure.

In cases of *complication of herpes with other affections*, Weinhold combined it with other remedies;—in *syphilitic eruptions*, adding corrosive sublimate, &c.

The efficacy of graphite in herpetic and other *cutaneous affections* has also been attested by many other respectable physicians, as Horn, Heim, Ruggieri, Brera, Bernstein, Hildenbrand, Richter, Hufeland, Marc,* &c. This circumstance gave occasion to its admission into the Prussian Pharmacopœia; yet it has not the confidence of physicians, even in those countries into the pharmacopœias of which it has been received, and is consequently but little prescribed.

Its use in chronic cutaneous diseases is said to have been suggested by the circumstance, that, in Venice, the makers of crayons are speedily cured of any such affections under which they may labour.†

* Riecke, Die neuern Arzneimittel, u. s. w. Stuttgart, 1837, S. 214; see, also, Weinhold, in Hufeland's Journal, B. xxxiv. St. 1. S. 118; Heim, in Horn's Archiv, 1810, xii. 326, and Ibid. 1811, B. 1. S. 91; Huber, in Med. Chir. Zeitung, 1811, No. 68, S. 282; Hufeland, Journ. der prakt. Heilkunde, B. xxxviii. St. 6; Bernstein, Ibid. B. xli. St. 5; Mayer, Ibid. B. lx. St. 2, and Osann, in Encyclop. Wörterb. der Med. Wissensch. x. 434. Berlin, 1834.

† Mérat and De Lens, in Dict. de Mat. Med. Art. Carbone.

METHOD OF ADMINISTERING.

Internally, graphite is given in doses of from five to fifteen grains, from two to four times daily ; and the dose may be augmented, according to circumstances, to a dram in the day. It is given in powder, or in the pilular form. Externally, it is applied in the form of ointment or plaster — from ℥ij. to ℥vj. of the graphite to an ounce of the constituent.

Pulvis ferri carbureti.

Powder of carburet of iron.

R. Ferri carburet.
Sacch. āā. ℥ss. M.

Divide in partes æqual. vi.

Dose. — One every two hours — in *lichen leproides*.
Hildenbrand.

Electuarium ferri carbureti.

Electuary of carburet of iron.

R. Ferri carburet. ℥ss.
Mellis despumat. ℥ij. M.

Fiat electuarium.

Dose. — A coffee-spoonful, morning and evening.
Weinhold.

Pilulæ ferri carbureti.

Pills of carburet of iron.

R. Ferri carburet.
Extract. dulcamar. āā. ℥j.
M. fiant pilulæ, pond. gr. ij. sing.

Dose. — Six, three times a day. *Märker.*

R. Ferri carburet. ℥ij.
Zinci. oxid. ℥ss.
Adipis, ℥j. M.

Mayer.

Unguentum ferri carbureti.

Ointment of carburet of iron.

R. Ferri carburet.
 Sulphur. āā. ℥ij.
 Adipis, q. s. ut fiat unguentum.

Brera.

Emplastrum ferri carbureti.

Plaster of carburet of iron.

R. Ferri carburet. ℥ij.
 Emplast. sapon. ℥iv.

Misce intimè.

Weinhold.

LXVIII. FERRI CITRAS.

SYNONYME. Citrate of Iron.

French. Citrate de Fer.*German.* Citronsäures Eisenoxydul.

Two citrates of iron have been proposed, of late years, by M. Béral*—the one the SESQUICITRATE OR CITRATE OF THE SESQUIOXIDE OF IRON; the other the CITRATE OF THE PROTOXIDE OF IRON.

MODE OF PREPARING.

The *citrate of the sesquioxide*, according to Mr. Duhamel† is prepared as follows:—Take of *Citric acid*, crystallized, iij. or 3 parts; *Hydrated oxide of iron*, dry, ℥ij. or 2 parts; *Distilled water*, ℥xij. or 12 parts. If the moist hydrate be used, about ℥vj. are required; but as the degree of moisture is not always the same, Mr. Duhamel suggests, that the oxide should be in excess. The ingredients above mentioned are boiled together in a matrass until the whole of the oxide is dissolved. The solution is filtered,

* Journ. de Chimie Médicale, and Amer. Journ. of Pharm. April, 1841, p. 72.

† Amer. Journ. of Pharmacy, Oct. 1842, p. 225.

and the filter washed with distilled water sufficient to obtain 12 parts of liquid. This forms what is kept by the French Pharmacians under the name LIQUID CITRATE OF IRON, marking 24° of Beaumé. It holds in solution one-third of its weight of dry citrate of iron.

Its taste is acid, but not disagreeable, and it is said to be of all chalybeate salts the least unpleasant to the taste.

The *citrate of protoxide of iron* is prepared by M. Béral,* by treating *iron filings* with *citric acid* previously dissolved in *distilled water*. It has a strongly marked chalybeate taste.

EFFECTS ON THE ECONOMY IN HEALTH.

The citrates of iron resemble, in their properties, the tartrate and the lactate of iron, and may be given in the same cases.

MODE OF ADMINISTERING.

The dose of citrate of iron may be the same as that of the salts above mentioned. It has been long administered in wine, of which the following are two forms; — the first from the Ham-burg, and the latter from the Wirtemberg, Pharmacopœia.

Vinum ferri citratis aromaticum.

Aromatic wine of citrate of iron.

R. Ferri limatur. ℥j.
 Limon. succ. ℥iij.
 Macera per noctem, et adde
 Gentian. ℥ss.
 Cinnam. ℥ij.
 Vini, ℥xvj.

Dose. — Of the decanted wine, f℥ss. to f℥ij. and more. This preparation or one analogous to it is said to be prescribed by certain physicians of this country — of Charleston, for example.†

Take of *Iron filings*, four ounces; *Bitter oranges*, four. Remove the peel, the white, and the seeds; beat them in a stone mortar, and let the paste remain at rest for two days; then pour upon it *Madeira wine*, ten ounces, and *Spirit of orange-peel*, two ounces. After sufficient digestion, express and filter.

* Ibid. April, 1841, p. 72.

† Duhamel, loc. cit.

This preparation is called, in the Wirtemberg Pharmacopœia, *Tinctura Ferri Aurantiaca seu Martis cum Vino Malvatico et Pomis Aurantiis*.* According to Mr. Gore,† it possesses the most agreeable odour and taste of any medicinal compound ever introduced into practice. It is aromatic, carminative and tonic ;” and he adds, that he has no doubt it will supersede the preparations in general use, when once it has been fairly tried. In *strumous habits* ; in *passive uterine hemorrhage* ; in *anasarca* from general debility ; in *chlorosis* ; in *malignant disease*, in which iron has been extolled by Mr. Carmichael and others ; and in all diseases, that arise from a *general deficiency of tone*, Mr. Gore considers this preparation to be “of exceeding utility, from its agreeable and chalybeate qualities.” He suggests, also, its use in *chronic bronchitis*, in which he gives it in combination with ipecacuanha wine.

M. Béral has likewise introduced a *Citrate of Protoxide of Iron and Quinia* — FERRI ET QUINIÆ CITRAS, which is formed by the union of four parts of *Citrate of iron* with one part of *Citrate of quinia* ; and may be given in the form of pills, wherever a combination of these tonics is needed.

LXIX. FERRI FERROCYANURETUM.

SYNONYMES. Ferri Cyanidum, F. Cyanuretum, F. Cyanogenatum, Kyanuretum Ferri, F. Oxydulatum Hydrocyanicum, F. Borussias, Ferri Sesquicyanidum, Ferri Ferrosesquicyanidum, F. Percyanidum, Ferrocyanas Oxydi Ferri, Ferri Ferrocyanas, Ferrum Cyanuretum, Ferrum Zooticum, F. Borussicum, Cœruleum Borussicum, C. Beroliniense, Prussiate or Cyanide of Iron, Cyanuret of Iron ; Prussian Blue, Berlin Blue.

French. Tritohydroferro-cyanate de Fer ; Deutoxycyanure de Fer Hydraté ; Tritohydrocyanate Ferruré de Fer, Prussiate de Potasse et de Fer, Bleu de Prusse.

German. Cyaneisen, Blaustoffeisen, Blausaures Eisenoxydul, Eisenblausaures Eisenoxyd, Eisencyanüreyanid, Berliner Blau, Pariser Blau.

In commerce, this preparation with us bears the name “*Prussian blue*,” but in Germany it is called “*Pariser Blau*.” It is not in a state of purity, and, consequently, that which the apothecary prepares is best adapted for internal use.

* Jourdan, Pharmacopie Universelle, i. 545, Paris, 1828.

† Dublin Med. Press, April 29, 1810, and Braithwaite's Retrospect, vol. i. p. 24, 3d. edit. Lond. 1812.

MODE OF PREPARING.

The form given by Buchner is as good as any. *Ferrocyanuret of potassium*, as commonly met with in commerce, is dissolved in warm *distilled water*, and to the clear filtered solution is gradually added, in a glass vessel, a solution of chemically *pure sulphate of iron* so long as a precipitate is thrown down. After the precipitate has fallen to the bottom of the vessel, and the supernatant fluid, which contains sulphate of potassa, has been poured off, the precipitate is first digested with *dilute sulphuric* or *muriatic acid*, in order to dissolve the excess of oxide of iron; the beautiful dark blue precipitate is then collected on a filter, carefully washed with boiling water, and dried.

The following form for the preparation of "*pure Prussian blue*," is admitted into the last edition of the Pharmacopœia of the United States:—Take of *Sulphate of iron*, ℥iv.; *Sulphuric acid*, f℥iiss.; *Nitric acid*, f℥vj., or a sufficient quantity; *Ferrocyanuret of potassium*, ℥ivss.; *Water*, Oij. Dissolve the sulphate of iron in a pint of water, and, having added the sulphuric acid, boil the solution. Pour it into the nitric acid, in small portions, boiling the liquid for a minute or two after each addition, until it no longer produces a dark colour; then allow the liquid to cool. Dissolve the ferrocyanuret of potassium in the remainder of the water, and add this solution gradually to the first liquid, agitating the mixture after each addition; then pour it upon a filter. Wash the precipitate with boiling water until the washings pass tasteless. Lastly, dry it and rub into powder.*

Ferrocyanuret of iron is of a beautiful deep blue colour, and devoid of odour and taste. It is decomposed by heat, and is insoluble in water, alcohol, ether, oils and dilute acids. Potassa and soda decompose it. It adheres firmly to the tongue, which Riecke thinks, — though erroneously, — is owing to its containing argil.

EFFECTS ON THE ECONOMY.

Of the effects of ferrocyanuret of iron on the human economy in health we have no evidence. Coullon gave it to various animals, but observed no action from it. It has been given, however, and not without success, in several diseases; and Dr. L. W. Sachs, who has not unfrequently administered it, considers it one of the most important chalybeates with which we are acquainted. He thinks it probable, that hydrocyanic acid has not

* Pharmacopœia of the United States, p. 109. Philad. 1842.

much agency ; yet it certainly seems to differ from all the other preparations of iron.

It has been especially recommended in *epilepsy* by Kirckhoff* of Ghent. In very obstinate cases, not dependent upon organic mischief, he succeeded entirely with it ; with the adult, he commenced with half a grain daily, and raised the dose gradually to three, four, and even six grains and upwards. When the patient was plethoric, he premised bloodletting, or applied leeches, from time to time, to the temples. Hildenbrand and Gergères confirm its efficacy in epilepsy. It has also been administered by Dr. Zollickoffer† successfully in a case of *chorea* ; three grains being given in the form of pill, three times a day. In six days, the girl, twelve years old, was entirely cured, after camphor, opium, quinia, and assafœtida, nitrate of silver, and subcarbonate of iron had been given in vain.

In *intermittent fever* Dr. Zollickoffer‡ found ferrocyanuret of iron so efficacious, that he even gave it the preference over cinchona ; and his experience has been confirmed by that of Eberle,§ Hosack,|| J. E. Craighead,¶ and others. Wutzer, in Germany, also exhibited it successfully ; and Stosch gave it advantageously, in combination with cinchona and rhubarb, in a case of obstinate intermittent. Sachs likewise tried it frequently, but as often without, as with, success. When it has proved efficacious in intermittents, the dose has been by no means large. Some have given six or eight grains every four hours during the apyrexia, and even as much as a scruple has been administered. Sachs found it several times efficacious, when four doses of two grains each were taken ; and Riecke,** affirms, that his father obtained essential service from it in the *leucophlegmatic conditions resulting from intermittent fever*.

Zollickoffer extols the ferrocyanuret also in *remittent fever* ; and there may, doubtless, be periods when it may be administered with benefit ; but it is not often used. He recommends it, likewise, in *dysentery*,†† when the inflammatory condition has passed away, either spontaneously or under the efforts of art ; and Sachs remarks, that in *atonic conditions of the intestinal canal*, which supervene on dysentery, it may doubtless be

* Journ. de Chimie Médicale, iii. 285. See, also, Journ. des Connais. Méd. Chirur. Août, 1841 ; and Encycl. des Scien. Méd. Sept. 1841, p. 468.

† Medical Examiner, May 16, 1840, p. 314.

‡ American Medical Recorder, v. 540.

§ Materia Medica, 2d edit. i. 233.

|| New York Medical and Physical Journal, 1823.

¶ Dunglison's Amer. Med. Intelligencer, May, 1842, p. 230.

** Op. citat. S. 217.

†† Chapman's Philadelphia Journal, Aug. 1823.

of great service. Gergères administered it successfully in *chronic diarrhœa*. L. W. Sachs enters into a long theoretical disquisition on the precise action of the remedy, in which there is, doubtless, much that is speculative. He used it, he says, with success, in many cases which it would be difficult to classify under any formal nosology; their common bond, however, was, that they were dependent upon "nervous disorders, especially of the plastic functions of the abdominal organs, the mischief appearing first of all to be gastric." In such affections he found a combination of the ferrocyanuret of iron with rhubarb especially serviceable. He gave it in not less than two grain doses, which he gradually augmented to six grains, three times a day. Dr. Moll saw decidedly good effects from its use in a case of *immoderate menstruation from atony of the uterus* with general elevation of the nervous excitability, after he had employed the remedies, commonly recommended, unsuccessfully. He found it also extremely beneficial to *children of a strumous habit*, and of great *torpor*.

Stosch found it serviceable in a case of *scrophula*, in which hæmatisis was imperfectly accomplished; and Dr. Bridges* obtained great advantage from it in a case of severe and protracted *facial neuralgia*.

Externally, the ferrocyanuret has been used in the form of ointment, in cases of *ill conditioned, torpid and foul ulcers*, and even of *noli me tangere*. Stosch applied it in a case of *fungous ulcer* with marked advantage; making it into a paste with water and applying it in that form.

MODE OF ADMINISTERING.

Pulvis ferri ferrocyanureti.

Powder of ferrocyanuret of iron.

R. Ferri ferrocyan. gr. iij. ad. xxxvj.
Sacchar. ℥ij. M. et divide in pulveres vj.

Dose. — A powder two or three times a day, in *epilepsy*.
Kirckhoff.

R. Ferri ferrocyan. gr. j., iv., vj., ad xij.
Sacch. ℥j.
Fiat pulvis in partes xij. æquales dividendus.

Dose. — A powder every two hours, in *epilepsy*.
Hildenbrand.

* Wood and Bache's Dispensatory, Art. Ferri Ferrocyanas.

R. Ferri ferrocyan.
 Guaiac. pulv. āā. ℥j.
 Misce et divide in chartulas xij.

Dose. — One, three times a day. — Employed successfully in *intermittents*.*

Pilulæ ferri ferrocyanureti.

Pills of ferrocyanuret of iron.

R. Ammoniac.
 Rhei rad.
 Ext. taraxac. āā. ℥j.
 Ferri ferrocyan. gr. xvij. ad. xxxvj.
 M. et fiat massa in pilulas lx. dividenda.

Dose. — Four to six, twice a day, in *disorder of the ganglionic system*.

Radius, according to *L. W. Sachs*.

Unguentum ferri ferrocyanureti.

Ointment of ferrocyanuret of iron.

R. Ferri ferrocyan. ℥j.
 Unguent. cetacei, ℥j. M. et fiat unguentum.

Applied to *foul ulcers*.

LXX. FERRI IODIDUM.

SYNONYMES. Ferri Ioduretum, Ferrum Iodatum, Iodated Iron, Iodide of Iron, Ioduret of Iron, Protoioduret or Protiodide of Iron.

French. Iodure de Fer, Protoiodure de Fer.

German. Iodeisen.

In solution, Ferri Hydriodas, Ferrum Hydriodatum, Ferrum Hydroiodicum Oxydulatum, Hydriodated Iron, Hydriodate of Iron, Hydriodate of Protoxide of Iron.

French. Hydriodate de Fer.

German. Hydriodsaures Eisenoxydul.

Although attention had been directed, several years ago, to this preparation, it was not much used, until Prof. A. T. Thom-

* Ellis's Formulary, 6th edit. p. 173. Philad. 1842.

son,* of the London University, recommended it strongly in a special monograph several years since. It has been received into different Pharmacopœias.

MODE OF PREPARING.

The following method is recommended by Dr. Thomson. One part of *iron wire* should be rubbed in a porcelain or wedgewood mortar, with about three or four parts of *iodine*, gradually adding *distilled water*, until fifteen parts of the fluid have been used: the whole is then to be introduced into a Florence flask, with an additional portion of *wire* and of *distilled water*. This excess of iron is a matter of indifference in the preparation of the hydriodate, and in that of the iodide it is necessary for preserving the combination from decomposition during the evaporation of the solution. These materials are next to be boiled together, until the fluid acquires a pale greenish colour, when it must be filtered. This solution contains a hydriodate of the protoxide of iron; and, if the exact quantity of the iodine be previously ascertained, so as to enable us to procure the solution of a definite strength, it may be kept in this state for medicinal use. In general, however, the solution is evaporated to dryness, and, for this purpose, it may be poured into a clean flask, containing a piece of iron wire sufficiently long to reach from the bottom to the surface of the fluid, and the boiling should be continued until the bulk of the solution be reduced to one-third. It must then be filtered, after which the evaporation should be continued to dryness. It is necessary to break the flask as soon as the mass is cold, in order to obtain the solid iodide, which should be immediately transferred to a dry bottle, accurately fitted with a ground stopper. The bottle should not hold more than two ounces of the preparation; for when it is large and not full, the iodide deliquesces nearly as rapidly as when it is exposed to the free action of the atmosphere. When the flask is broken, and the iodide bottled before the mass is cold, deliquescence also takes place, a peroxide of the metal is formed, and iodine is evolved.

The form for the preparation of the solid iodide recommended in the last edition of the Pharmacopœia of the United States is the following:—Take of *Iodine*, ℥ij., *Iron filings*, ℥i., *Distilled water*, a pint and a half. Mix the iodine with a pint of the distilled water in a porcelain or glass vessel, and gradually add the iron filings, stirring constantly. Heat the mixture gently

* Some Observations on the Preparation and Medicinal Employment of the Ioduret and Hydriodate of Iron. 8vo. pp. 64. Lond. 1834.

until the liquid acquires a light greenish colour; then filter, and after the liquid has passed, pour upon the filter half a pint of the distilled water boiling hot. When this shall have passed, evaporate the filtered liquor at a temperature not exceeding 212° , in an iron vessel, to dryness. Keep the dry iodide in a closely stopped bottle.*

The plan proposed by Mr. Durand,† of Philadelphia, after that by MM. Baup and Caillot,‡ for preparing the solution of the protiodide of iron (hydriodate of protoxide of iron) is the following:—Take of *Iodine*, ℥x. , *Iron filings*, perfectly pure and unoxidised, ℥v. , *Distilled water*, ℥xliiss. Put the iodine into a porcelain capsule, with one-half the quantity of water, add the iron filings by small portions, stirring the mixture with a glass rod. The combination soon takes place; heat is evolved with the disengagement of a small quantity of vapour of iodine, and the mixture acquires an orange colour, which gradually deepens to a dark red. When the whole of the iron has been added, the capsule is put in a sand bath, or over the flame of a spirit lamp, and heated slowly; continuing to stir the liquid. An ioduretted hydriodate of iron is first produced, which, under the action of heat, soon passes to the state of a simple hydriodate. This point is indicated by the entire discoloration of the solution. In this state it is filtered; and the dregs and filter are carefully washed with the remaining half of the distilled water, previously heated to the boiling point. In this manner, a solution forming twelve and a half fluid ounces is afforded, one ounce of which represents one dram of iodide of iron.

The solution, which is at first colourless, acquires a deep red colour by standing, and precipitates some oxide of iron; by which it is reduced to the state of an ioduretted hydriodate of iron; but it may be easily restored to its former state by heating it again with a small quantity of iron filings, until the liquid becomes colourless: or, to prevent these changes, a coil of soft iron wire may be kept immersed in it; a fact, which has been long known,§ but which M. Dupasquier has recently rediscovered.||

The iodide of iron is obtained by evaporating to dryness the filtered solution, taking care, towards the end, to stir incessantly with an iron spatula, and to detach the salt from the bottom of the capsule as it forms. The heat must be managed most carefully, diminishing it gradually, and removing the capsule quickly from the fire as soon as the odour of iodine is evolved. The solution of this salt, when the iodide is well prepared, is of a

* Pharm. of the United States, p. 110. Philad. 1842.

† Philad. Journ. of Pharmacy, iv. 287. Philad. 1833.

‡ Ibid. i. 201.

§ Mr. Squire, Annals of Philosophy, May, 1836, p. 79.

|| Journal de Pharmacie, Mars, 1842, p. 224.

pale greenish colour, and deeper in proportion to the decomposition, which some parts may have undergone towards the end of the operation.

Iodide of iron requires to be well secured from the influence of the atmosphere, both on account of its deliquescent property, the rapid oxidation which the metal undergoes when deliquescence occurs, and the consequent decomposition which takes place. It is important to prevent this, as the peroxide of iron is comparatively inert as a medicinal agent; whilst the free iodine extricated during its oxidation, according to Dr. Thomson, alters altogether the virtues of the medicine. This partial decomposition of the iodide is rendered immediately apparent on dissolving it in twenty times its weight of distilled water, and filtering: instead of a permanent, clear, very pale greenish-yellow, we obtain an ochre-coloured, completely insoluble precipitate. Much of the iodide, usually prepared, is of this description, and to this may, doubtless, be referred some of the disappointment and discrepancy amongst practitioners as to the operation of the medicine in cases apparently similar. Even when the iodide has been carefully prepared, it often contains a little free iodine; but, according to Thomson, it is chiefly owing to the carelessness of assistants and apprentices in compounding prescriptions, by frequently exposing the iodide to the air, that its properties, and, consequently, its medicinal powers, are impaired: hence, it is preferable to keep it in solution, or in the form of hydriodate, which it becomes, whenever water is added to it.

If the solution be prepared with a definite quantity of iodine, as described, it will keep without changing its characters; but as it is usually made, by dissolving the iodide in distilled water, it requires to be rendered neutral by the following means:—Introduce into a flask the solution of any given strength, and place in it two or three doubles of clean and soft iron wire, sufficiently long to extend to the surface of the fluid; boil for a few minutes, and then leave it at rest, until the solution becomes clear, after which it may be either decanted off from the precipitate which forms, or filtered: no farther change takes place in a solution thus treated, provided it be kept in a blackened or a green bottle, however long it may be preserved. In this process, the wire affords iron to saturate any free iodine present in the solution, or that may have been extricated by the formation of the peroxide of iron in the iodide; and a perfectly neutral solution being thus obtained, by the immediate conversion of the newly formed iodide into the hydriodate of the protoxide, no subsequent change takes place so long as the solution is kept secluded from the light. The best proportions, according to Dr. Thomson, for forming the medicinal solution, are three grains of the dry solid iodide to each fluidram of distilled water. If the

water be not either distilled or filtered rain water, perfectly free from foreign ingredients, and particularly if it contain any earthy or saline carbonates, decomposition instantly takes place, iodine is extricated, and a carbonate of iron, which rapidly passes into the state of a peroxide of that metal, is precipitated.

To protect the solution of iodide from decomposition, it has been advised to associate it with sugar, which appears to exert the same protective agency as it does on the protocarbonate of iron. With this view, the following preparation has been proposed by Mr. Wm. Procter, Junr.* Take of *Iodine*, 11 drams; *Iron filings*, 4 drams; *Syrup, Uncrystallizable honey*, or *Uncrystallizable sugar*, 4 ounces; *Distilled water*, a sufficient quantity. Mix the iodine with eight fluid ounces of the distilled water, and gradually add the iron filings, stirring constantly; then apply a gentle heat until the solution shall have acquired a light green colour, or shall not give a blue colour to a solution of starch; then add whichever of the three protecting saccharine substances may be chosen, continue the heat a short time, and filter. Lastly, wash the filter with as much distilled water as will make sixteen fluid ounces of solution of iodide of iron.

The LIQUOR FERRI IODIDI or *Solution of Iodide of Iron* of the last edition of the Pharmacopœia of the United States (1842), is essentially the same as this. The saccharine matter employed in it is prepared honey. The solution, thus obtained, is of a pale greenish colour. It has little or no sediment.

M. Oberdörffer, of Hamburg,† gives the following form for the preparation of the *sesqui-iodide of iron*; whose effects, and mode of administration, are the same as those of the iodide. It may be preserved for a long time without undergoing decomposition. Mix in a glass vessel half an ounce of *iodine*; a dram and a half of *iron filings*; and an ounce of *water*. When the reaction is completed, the mixture is to be slightly shaken, until it becomes of a clear green colour, which is due to the iodide of iron. It is then diluted with four ounces of water, filtered, and some water is passed through the filter. To the solution two drams of iodide are afterwards added, which are readily dissolved. A deep reddish-brown liquid results, to which a sufficient quantity of water is added to make the weight of the whole ten ounces. Each dram contains about four grains and a half of iodine.

When iodide of iron is carefully prepared, it is of an iron-gray colour, foliated texture, brittle, and exhibits a crystalline arrangement similar to metallic antimony, except that it is darker. In

* American Journal of Pharmacy, for July, 1840, p. 13; and Ibid. for Jan. 1841, p. 323.

† Zeitschrift für die gesammte Medicin. Juin, 1840, S.

the dry state, it is inodorous; but when moist, it smells somewhat of iodine: the taste, when dry, is simply styptic; when moist, somewhat acrid, before it impresses the gustatory organs. At 350° of Fahrenheit it fuses; and, at a higher temperature, is decomposed,—the iodine being volatilised, and the iron remaining in the state of oxide. It dissolves in all proportions in water,—the changes supervening, which have been already indicated. It is decomposed by chlorine, the mineral acids, oxide of arsenic, meconic acid—consequently by opium and laudanum—gallic and tannic acids, the pure and carbonated alkalies, different metallic salts, and by the infusions of digitalis, belladonna, hyoscyamus, tobacco, amylaceous substances, &c.: such articles ought not, therefore, to be given in combination with it.

EFFECTS ON THE ECONOMY IN HEALTH.

From experiments made on his own person, Dr. Thomson states the following to be the physiological effects of iodide of iron.

When taken in doses of from three to five grains, it makes no sensible impression on the stomach, although it sharpens the appetite, and improves the digestive function: it seems to stimulate moderately the digestive canal through its entire length; for it opens the bowels; and, whilst it produces the black colour of the alvine discharges characteristic of all the preparations of iron, it corrects their fætor. When it does not affect the bowels, it augments the action of the kidneys, increasing the flow of urine; and if the solution be taken two or three times a day, for several days in succession, the presence of both the iodine and the iron can be readily detected in the urine. The temperature of the skin is moderately elevated, and the insensible perspiration increased. On one occasion, having taken ten grains for a dose, it almost immediately caused an uneasy sensation at the epigastrium, accompanied with nausea, that continued for several hours, and a slight degree of headach. These symptoms were relieved by a copious evacuation, which was perfectly black. Two hours after taking the medicine, a large quantity of urine was discharged; which, on being tested, displayed the presence of both iodine and iron.

The experiments on animals, made by Dr. Cogswell,* induced him to infer:—1. That iodide of iron acts as a local stimulant, possessing the power of effecting peculiar disorganization.—2. That its action is more particularly directed to the track of the alimentary canal.

* Essay on the Iodine, p. 132. Edinb. 1837.

When added to blood out of the body, it promotes its coagulation.*

EFFECTS ON THE ECONOMY IN DISEASE.

From the chemical composition of iodide of iron, Dr. Thomson considered it might be specially adapted for cases in which augmented activity of the capillary or intermediate system, with a tonic effect, might be indicated, and particularly in *scrophulous affections, tabes mesenterica, chlorosis, incipient scirrhus, rickets, amenorrhœa, bronchocele, atonic dyspepsia*, — indeed in all cases accompanied by debility. In such affections, he conceives the iodide will act more efficiently than any of the other preparations of iron. In *secondary syphilis*, it may be combined, he suggests, with iodide of potassium; and in *incipient cancer*, its efficacy, is aided by the administration of arsenic at the same time. Dr. Thomson has found it serviceable in *atonic gastric dyspepsia*, when combined with bicarbonate of potassa, and taken at the moment of admixture, in the dose of from three to eight grains or more.† A great advantage it possesses is its ready solubility, owing to which it can enter the circulatory system with facility, and modify the condition of the fluids. In *chronic scrophulous cases*, it produces all the good effects of the preparations of iron, without any of the concomitant and subsequent symptoms that are so apt to supervene, especially in impressible individuals. Where the case is accompanied by vascular erethism, or fulness, it must be reduced before the iodide can be esteemed appropriate. In *chlorosis, occurring in strumous habits*, it has been found most serviceable. Its efficacy in cancer is elucidated by Dr. Thomson, by the details of a case of *scirrhus mamma*, which, after protracted and fruitless treatment by other agents — as by other preparations of iron combined with conium — ultimately yielded to a combination of iodide of iron and conium.

Some cases are also detailed in which iodide of iron was very effective in removing *old syphilitic affections, especially of the skin*. M. Baumes,‡ who employed the iodide with the most satisfactory results in old and obstinate *syphilitic ulcers*, especially when the patient was feeble and scrophulous, gave it in the form of pills with extract of opium, — increasing the dose of the

* Magendie, Leçons sur le Sang, &c.; and translation in the Lancet, Jan. 26, 1839.

† London Dispensatory, and Brande's Dictionary of Mat. Med. p. 252. Lond. 1839. See, also, Solon, in Dict. de Méd. et de Chirurg. Pratiq. Art. Iode; and Ashwell, in Guy's Hospital Reports, p. i. 128; and p. iii. p. 555.

‡ Medico-Chirurgical Rev. Oct. 1840.

iodide from two or three to twelve or twenty grains in the twenty-four hours. Along with the cicatrisation of the sores, the improvement of the general health was most remarkable.

Prior to the publication of Thomson, Pierquin had given the iodide in cases of *leucorrhœa* and *amenorrhœa*; and Eager* had recommended it in *scrophula*. Ricord† found the very best effects from its internal use in cases where tonics required to be combined with antisymphilitic remedies, especially where any *scrophulous vice* (*lymphatisme*) constituted a complication. He administered it, likewise, with great success, to remove the *consequences of syphilis*; and found it advantageous in *atonic ulcers of the legs* and in *spreading ulcers of the throat*, which had been aggravated or had not yielded to mercury. The strength of M. Ricord's solution was half a dram of iodide to ℥viiij. of water, given, we presume, in the twenty-four hours.

M. Ricord‡ also uses it in the form of injection in cases of *blennorrhœa*. Wherever, indeed, tonic astringent injections are needed, the iodide, in his opinion, should occupy the first rank. Its use, he thinks, can only be contraindicated when there is much inflammation, or pain, in passing the urine, or when cystitis exists. The strength of the injection should be three grains to the ounce of water.

In consequence of its promoting the coagulation of the blood out of the body, Magendie§ prescribed it in the form of injection (ʒi. to ℥ij. of water) employed several times a day in a case of severe *uterine hemorrhage*. The hemorrhage ceased.

Mr. B. Phillips|| prefers the iodide of iron to any of the preparations of iodine. The minimum dose has been a grain twice a day; the maximum three grains three times a day. In 232 cases, it was only necessary to intermit its use for a few days in three cases. In one it excited pyalism. About once a week he gives an aperient or cathartic. In cases of scrophulous ulceration, as a consequence of abscess, or from other causes, he employs, with the best effect, a lotion containing three or four grains of the iodide to an ounce of distilled water. Where parts are irritable, he usually recommends the ointment of iodine to be applied to the part on lint.

The author has frequently given this remedy in public and private practice, and has considered it especially adapted for those cases in which there appears to be torpor in the system of

* Dublin Journal of Med. Science, 1834; also, Cogswell on Iodine, p. 138, Edinb. 1837.

† J. J. L. Rattier, in *La Lancette Française*, Fév. 4, 1837.

‡ J. J. L. Rattier, *Ibid.* Fév. 16, 1837; see, also, *Revue Médicale*, Janvier, 1838, and *Dunlison's Amer. Med. Intelligencer*, Sept. 15, 1838, p. 195.

§ *Op. cit.*

|| *Lond. Med. Gazette*, Jan. 10, 1840.

nutrition, as in cases of *asthenic dropsy*, *old visceral engorgements*, and indeed of *hypertrophy of any kind*, accompanied by *deficient action in the system of nutrition*. In *oligæmia*, where there is paucity of red globules in the blood, and the fluid is altogether too thin, it would seem to be especially indicated, from its property, mentioned above, of promoting the coagulation of the blood, and therefore, of inspissating it. Hence, in all cases of *scorbutic*, *hydropic* and *other dyscrasies*, and in *hemorrhages occurring in such pathological conditions* of the system, the author has prescribed it largely, and with excellent effects. It appears to him to be the best remedy we possess wherever an entrophic and tonic are indicated.

MODE OF ADMINISTERING.

The dose of iodide of iron, administered in the cases above referred to, was generally three or four grains two or three times a day.

The following formulæ have been recommended by Pierquin:

Vinum ferri iodidi.

Wine of iodide of iron.

R. Vin. Bordegalens, Oj.
Ferri iodidi, ʒss. M.

Dose. — A tea-spoonful, morning and evening.

*Pierquin.**

Tinctura ferri iodidi.

Tincture of iodide of iron.

R. Ferri iodidi, ʒij.
Alcoholis,
Aquæ, aa. f. ʒij. M.

Dose. — A tea-spoonful, morning and evening.

Pierquin.

* Journal de Chimie Médicale, p. 310, Mai, 1831.

Syrupus ferri iodidi.*Syrup of iodide of iron.*

Various forms have been given for this preparation.* The following is the one admitted into the last edition of the Edinburgh Pharmacopœia: — Take of *Iodine* (dry), 200 grains; *Fine iron wire*, recently cleaned, 100 grains; *White sugar*, in powder, four ounces and a half; *Distilled water*, six fluid ounces. Boil the iodine, iron and water together in a glass matrass, at first gently, to avoid the expulsion of iodine vapour, afterwards briskly till about two fluid ounces remain. Filter this quickly while hot into a matrass containing the sugar; dissolve the sugar with a gentle heat, and add distilled water to make up six fluid ounces.

Twelve minims of this syrup contain one grain of the iodide. It ought to be nearly colourless or pale yellowish-green, and without sediment. Dr. Christison states, that it will always be defective in strength “when made with British iodine as now commonly met with in the market, unless allowance be made for the water, which it very generally contains in large proportion.”†

Trochisci ferri iodidi.*Lozenges of iodide of iron.*

R. Ferri iodidi, ℥ss.

Croci pulv. ℥ij.

Sacchar. ℥iv.

M. fiant Trochisci No. 120.

Dose. — Six to ten, daily.

Pierquin.

* Frederking, Repertor für die Pharmacie, 1839, and Amer. Journ. Med. Sciences, Feb. 1840, p. 449; Dupasquier, Journ. de Pharm. Mars. 1841, p. 116, and Mars, 1842, p. 225; F. Boudet, Ibid. Sept. 1841, p. 335; M. Béral, Journ. de Chim. Méd. and Amer Journ. of Pharmacy, April, 1841, p. 74; Dr. A. T. Thomson, Lond. Pharmac. Transactions, Aug. 1841; and Amer. Journ. of Pharmacy, April 1842, p. 60; and M. Leistner, Journ. de Pharmacie, Février, 1842, p. 122.

† Dispensatory, p. 431. Edinb. 1842.

Solutio ferri iodidi.

Solution of iodine of iron.(French, *Eau d'Hydriodate de Fer.*)

R. Ferri iodidi, ℥ss.
 Aquæ, Oij. M.

Added to enemata, lotions, and injections.

R. Ferri iodidi, ℥ss. ad ℥ij.
 Aquæ destillat. Oj. M.

To be added to a general bath, in cases of *leucorrhœa*, *amenorrhœa*, &c.

Injectio ferri iodidi.

Injection of iodide of iron.

R. Ferri iodid. gr. iij.
 Aquæ destillat. f.℥vi. M.

The quantity may be increased to nine grains to the ounce of water, care being taken to avoid irritation.

Used in *gonorrhœa*.

*Ricord.**

Unguentum ferri iodidi.

Ointment of iodide of iron.

R. Ferri iodidi, ℥iss.
 Adipis, ℥j. M. ut fiat unguentum.

A piece of the size of a hazelnut to be rubbed, morning and evening, on the inner part of the thigh, in cases of *leucorrhœa* and *amenorrhœa*.

* A Practical Treatise on Venereal Diseases, translated by Drummond, Amer. Edit. p. 237, 249. Philad. 1843.

LXXI. FERRI LACTAS.

SYNONYMES. Lactate of Iron, Lactate of Protoxide of Iron.

This preparation has been recommended by MM. Gelis and Conté, *internes* at La Charité, in Paris, and has been favourably reported upon by M. Bouillaud, in the name of a committee, consisting of MM. Bally, Fouquier, and Bouillaud.*

MODE OF PREPARING.

MM. Gelis and Conté prepare lactate of iron by treating *pure iron filings* with *lactic acid*, diluted with water. M. Louradour† extracts lactic acid from whey, which he collects from the dairies in the neighbourhood of Paris, where much cheese is made. The whey, exposed a long time to fermentation under the influence of an elevated temperature, becomes charged with a large quantity of lactic acid. It is evaporated to one-third or one-fourth of its volume, decanted and filtered; and is then saturated with *milk of lime*, which produces an abundant deposit, chiefly of phosphate of lime. The filtered solution is precipitated by *oxalic acid*, and again filtered, and then concentrated to a syrupy consistence. It is now diluted with *alcohol*, which precipitates the lactine and the salts. The solution on being filtered, and the alcohol distilled off, yields pure lactic acid.

LACTATE OF PROTOXIDE OF IRON is prepared by digesting in a sand-bath, at a low temperature, this *acid*, diluted with *water*, upon *iron filings*. At the end of six or seven hours of reaction, the liquid is boiled, filtered, and concentrated; when, on cooling, it deposits crystals. These crystals, drained on a flannel, and washed with *alcohol* by displacement, should be dried rapidly, and be preserved from any contact with the air.

The salt presents itself under the form of crystalline plates, which are very white, and but slightly alterable. It is but sparingly soluble in water; reddens litmus paper, and possesses the ferruginous taste in a tolerable degree. When dissolved in water, it attracts oxygen, and quickly becomes yellow.

The sparing solubility of lactate of iron has permitted M. Lou-

* Journal de Pharmacie, and Amer. Journal of Pharmacy, July, 1840, p. 121. See, also, M. Béral, Journ. de Chimie Médicale, and Amer. Journ. of Pharm. April, 1841, p. 74.

† Bulletin Général de Thérapeutique, Mars, 1840.

radour to simplify still more his process, by omitting the purification of lactic acid by alcohol, and treating it immediately by iron filings: the liquor, suitably evaporated, affords crystals of the lactates: the foreign salts, and the lactine remain in the mother waters, which are rejected.

As the lactate would seem to be often adulterated with effloresced sulphate of iron, or the same precipitated with alcohol, or with starch or sugar of milk, M. Louradour recommends, that no lactate should be used except what is under the form of crystalline plates, which do not readily admit of fraud.*

EFFECTS ON THE ECONOMY.

Lactate of iron has been used in cases in which protocarbonate of iron is employed, and chiefly in *chlorosis*. MM. Gelis and Conté are disposed to refer the beneficial agency of the protocarbonate to its becoming lactate of iron in the stomach, by uniting with the lactic acid, which has been presumed to be one of the gastric acids. This idea led them to administer lactate of iron, ready formed. In *chlorosis* the remedy has been given by MM. Fouquier, Bally, Beau, Rayer, Nonat, Andral, Bouillaud, and others, who have collected a great number of cases, which show its success in that disease.†

M. Bouillaud‡ made trial of the lactate in twenty-one cases, 14 of which were treated at La Charité. One of the last, not being decidedly chlorotic, may be excluded. Of the thirteen, ten were females, and three males. Of the ten females, eight presented well marked chlorosis; two were rather anæmic. The dose of the lactate was carried to six, eight, ten, twelve, and fifteen lozenges, each containing about five *centigrammes* of the salt (gr. $\frac{3}{4}$) in the twenty-four hours. The remedy was well borne; and it always increased the appetite sensibly.

MODE OF ADMINISTERING.

MM. Gelis and Conté introduce freshly prepared lactate of iron into lozenges, in which the sugar prevents the superoxidation of the iron, and preserves the medicine, whilst, at the same time, a form is given, which allows of great facility of adminis-

* Journ. de Pharmacie, and Amer. Journ. of Pharmacy, Oct. 1840, p. 230.

† Bulletin Général de Thérapeutique, Mars, 1840; also, La Lancette Française, London Lancet, Feb. 8, 1840, p. 707, and Dunglison's Amer. Med. Intelligence, April 1, 1840, p. 13.

‡ Encyclopédie des Sciences Médicales, Mars, 1840, p. 226. Académie Royale de Médecine de Paris, Seance du 4 Février, 1840.

tration. MM. Andral and Fouquier seldom exceed twelve grains of the lactate in the twenty-four hours ; and M. Bouillaud never gives more than twenty.

The following formulæ have been proposed by Mr. Cap :*

Trochisci ferri lactatis.

Lozenges of lactate of iron.

R. Ferri lactat. ℥vij. gr. 72 (30 grammes.)
Sacchar. ℥xiss. (360 grammes.)
Mucilag. acaciæ, q. s.

Make into lozenges each weighing gr. x. (65 centigrammes) which will contain gr. ¾ (5 centigrammes) of the salt.

Syrupus ferri lactatis.

Syrup of lactate of iron.

R. Ferri lactat. ℥i. (4 grammes.)
Aqua destillat. bullient. ℥viss. (200 grammes.)
Sacchar. alb. ℥xij. (400 grammes.)

M. Cap considers the use of this syrup to be more convenient than that of the lozenges, because the ferruginous taste does not remain so long in the mouth.

Pilulæ ferri lactatis.

Pills of lactate of iron.

R. Ferri lactat.
Althææ pulv. āā. gr. xvss. (1 gramme.)
Mellis, q. s. ut fiant pil. xx.

Chalybeate bread has been administered in one of the largest hospitals of Paris to chlorotic patients, and with the best effects. From four to five grains of the lactate of iron may be mixed with every three and a half ounces of bread, without giving it any unpleasant taste or injuring its quality.†

* Journal de Pharmacie, and Amer. Journ. of Pharmacy, Oct. 1840, p. 228.

† Provincial Med. and Surg. Journ. June, 1841, cited in Amer. Journ. of the Med. Sciences, Jan. 1842, p. 217.

LXXII. FERRI NITRAS.

SYNONYMES. Ferrum Nitratum, Nitrate of Iron.

LIQUOR FERRI PERSESQUINITRATIS.

SYNONYMES. Liquor seu Solutio Nitratis Ferri, Liquor Ferri Nitrici Oxydati, Solution of Persesquinitrate of Iron, Solution of Nitrate of Iron.

MODE OF PREPARING.

This preparation, which has been introduced within the last few years into practice, may be formed in the following manner :

Take of small chips or pieces of *Iron wire*, an ounce and a half; *Nitric acid*, three ounces by measure; *Water*, twenty-seven ounces; *Muriatic acid*, one dram. Put the iron into an earthenware vessel, and pour on the nitric acid, previously diluted with fifteen ounces of the water. Set the vessel aside till the whole of the acid has united with the iron, so as to form a persesquinitrate; then decant the liquid from the portion of iron, which remains undissolved; strain and filter. Add the muriatic acid with the remainder of the water, or with as much of that liquid as will increase the whole solution to thirty ounces.

When the process is finished — which takes some hours — the liquid has a red colour, so dark, that when viewed by reflected light, it seems almost black.

Three ounces of nitric acid of the usual strength (1.4) generally dissolve an ounce of iron, so that when the process is completed, a portion of the metal remains undissolved. The solution then consists entirely of persesquinitrate of iron; and, if speedily decanted, it may be preserved in that state; but if allowed to stand for a few hours longer on the iron, it will undergo a farther change, becoming gradually converted into pernitrates and protonitrates of iron. The first of these is insoluble, and renders the liquid turbid; and the latter, which remains dissolved, has not the medical properties, that render the persesquinitrate valuable. When the solution contains nothing but nitric acid and peroxide of iron, it slowly undergoes decomposition on standing, so that, at the end of a few weeks, the whole liquid begins to become turbid. The addition of some muriatic acid prevents this decomposition, and the quantity sufficient for this purpose is too small to affect the medicinal powers of the persesquinitrate. The solution, when properly prepared, is of a beautiful dark red colour,

when viewed with transmitted light. Its taste is very astringent, and not at all caustic.*

EFFECTS ON THE ECONOMY.

This preparation greatly resembles the solution of chloride of iron in its medicinal properties. Mr. Kerr considers, that to an astringent power it unites the property of diminishing the *irritability and tenderness of the mucous membranes* with which it comes in contact.

Kopp administered it with the greatest success in many cases of *chronic diarrhœa*, that had resisted every approved remedy. The *fæces* were blackened by it, as by the preparations of iron in general. He remarks, that it must be continued for some time. The dose he gave was ten drops several times a day in oatmeal gruel, and this was gradually raised to twenty and twenty-five drops. When the cure was accomplished, the remedy was gradually diminished, until it was left off altogether.

Dr. Graves† speaks in equally high terms of the persesquinitrate in these cases; and Dr. T. C. Adam of Lenawee County, Michigan, has recorded the remarkable assistance, which he has derived from its use in the treatment of several diseases, especially *diarrhœa* and other *affections of the mucous membranes accompanied by discharges*.‡ In *chronic diarrhœa*, depending mainly on an excess in the sensibility of the organic nerves which supply the digestive tube, Dr. Adam rarely orders less than fifteen drops at the commencement, and after a few days' employment of the remedy, he increases the quantity to twenty, twenty-five and thirty drops.

In *leucorrhœa*, occurring in such as are pale, exanguious, feeble and languid, the internal, conjoined with the external, use of the persesquinitrate has been found very advantageous. In these cases, Dr. Adam adds such a quantity of water as a diluent as will still leave in the vagina a gentle degree of heat or smarting.

Dr. Adam recommends it, also, in cases of *aphthous sores*; and he affirms that its application has afforded relief in *toothach*.

It is, doubtless, a powerful astringent, but it is questionable whether it possess any advantage over the tincture of chloride of iron.

* Mr. Kerr, in American Journal of the Medical Sciences, for May, 1832, cited from the Edinb. Med. and Surgical Journal.

† Clinical Lectures, Dunglison's Amer. Med. Library Edition, p. 128. Phila. 1838.

‡ American Journal of the Medical Sciences, May, 1839, p. 61.

LXXIII. FERRI OX'IDUM HYDRA'TUM.

SYNONYMES. Ferri Sesquioxidum Hydratum, Ferrugo, Hydras Ferricus, Ferrum Oxydatum Hydratum, Hydro-oxide of Iron, Hydroxide of Iron, Hydrated Oxide of Iron, Hydrated Peroxide of Iron, Hydrated Tritoxide of Iron, Hydrated Sesquioxide of Iron, Oxyhydrate of Iron.
German. Eisenoxydhydrat.

Hydrated oxide of iron has been introduced into practice as an antidote to white arsenic. Dr. Bunsen, of Göttingen, had already made frequent experiments with it, which satisfied him, that it was an efficacious agent, when, along with Dr. Berthold,* he subjected it to fresh trials. The results of their investigations were published, and since then it has received due attention everywhere.

METHOD OF PREPARING.

The best mode of preparing it, according to Dr. Bunsen, is to take a solution of *pure sulphate of iron*, increase its dose of oxygen by treating it with *nitric acid*, and precipitate the oxide by adding *pure ammonia* in excess, washing the precipitate. In order not to deprive the precipitate of its water, and to diminish its loose state of aggregation as little as possible, it is not filtered, but is put aside for a few days, until the precipitate is wholly deposited, after which the supernatant fluid is poured off. It is then kept in well-stopped vessels.

Riecket has added the formula for pharmaciens, which is recommended by Von Spécz:—

R. *Vitrioli ferri puri crystallizati* libram; teratur in pulv. subtiliss. et detur in vas. porcellan. aut murrhinum, impositum balneo arenæ, dein adde *acidi nitrici concentrati* ℥ss.; terantur ope baculi vitrei usque dum massa resolvitur in pulvem; nunc, igne animato, massæ pultacæ calidæ affunde sensim terendo, sensim *acid. nitric. concentrat.* q. s. donec nullum amplius evolvatur gas nitrosus. Massa tunc leni igne evaporetur ad siccitatem et solvatur demum in aq. destill. q. s.; solutioni filtratæ instilletur *ammonia puræ* q. s. donec precipitatio cesset; stent nunc per horam unam alteramve et liquor limpidus a sedimento bruneo decantetur; massæ residuæ fundum petenti adfunde aq. des-

* Das Eisenoxydhydrat ein Gegengift der arsenigen Säure. Götting. 1834.

† Die neuern Arzneimittel, S. 227. Stuttgart, 1837.

tillat. \mathfrak{Hij} . et agitentur; nunc filtra, et præcipitatum in filtro aq. destill. q. s. edulcora donec aqua insipida defluat. Præcipitatum bene edulcoratum in umbrâ siccatum convertat. in pulv. subtilissim. qui servetur vase vitreo bene clauso.*

Lassaigue advises it to be prepared as follows: — Take *iron filings*; pour gradually upon them four times their weight of the *nitric acid of commerce* in small portions. Heat is thereby developed, and deutoxide of azote, which is transformed by the atmospheric air into nitrous acid vapours. When the evolution of gas has ceased, ten or twelve parts of *water* are added; the mixture is then filtered, and *ammonia* added until the mixture begins to exhibit an alkaline reaction. The precipitate, thus formed, is the hydrated oxide of iron, which is collected on the filter, and washed with *boiling water* until it is tasteless, and ceases to exhibit any alkaline characters.

The mode of preparation, recommended by Majesté, agrees with this, except that he boils one part of *iron filings* with four of *nitric acid* and four of *muriatic acid*.

The following form has been advised by Dr. William R. Fisher,† who asserts that it was subjected to practice by Mr. Durand, an able *pharmacien* of Philadelphia, who obtained a perfect result, with a satisfactory economy of material. Take of *Sulphuric acid* (67° Baumé), 8 oz. or 16 parts; *Iron wire*, 8 oz. or 16 parts; *Nitric acid* (49° Baumé), 5½ oz. or 11 parts; *Water of ammonia*, as much as is sufficient; *Water*, a gallon and a half, or 384 parts. Mix the sulphuric acid with the water in a glass vessel. Add the iron, and, after the effervescence has ceased, filter. Add the nitric acid in divided portions, and apply heat so long as orange-coloured fumes are given off. To the heated solution, pour in the water of ammonia until a decided excess has been added; then wash the precipitate by decantation, until the washings give no precipitate with nitrate of baryta.

* "Take of *pure crystallised sulphate of iron* a pound: rub it into a subtle powder, and place it in a porcelain or glass vessel in a sand-bath; then add half a pound of *concentrated nitric acid*; stir them with a glass rod until the mass is resolved into a soft paste; then — the fire being raised — pour gradually on the hot pultaceous mass *concentrated nitric acid*, until no more nitrous gas is evolved. Let the mass be evaporated by a gentle heat to dryness, and at last be dissolved in a sufficient quantity of distilled water. Into the filtered solution drop *pure ammonia* as long as any precipitate occurs; let it now stand for an hour or two, and then pour off the limpid liquor from the brown sediment. On the residuary mass, remaining at the bottom, pour three pounds of distilled water, and shake them together: filter and wash the precipitate on the filter with distilled water, until the water is tasteless. The well-washed precipitate dried in the shade forms a subtle powder, which may be kept in a well closed vessel."

† Amer. Journ. of Pharmacy, vol. vi. No. 1, April, 1840.

The water is then to be drawn off until just enough remains to give the consistence of thick cream. It has been supposed that this preparation is not injured by keeping ; but some careful experiments by Mr. Wm. Procter, Junr.,* show, that even when kept under water its power of neutralizing arsenious acid gradually decreases ; that if kept in the form of a thick magma, it will retain its properties longer than when mixed with much water ; and that this decrease of power is probably owing to a change in the relative proportion of the oxide, and the water chemically combined with it, as well as to an alteration in its state of aggregation.

Mr. Procter advises, that a ferruginous solution similar to that advised in the United States Pharmacopœia should be kept in every shop as a source for obtaining the peroxide ; and that the solution of ammonia should be added to it when the demand occurs, and the peroxide be separated in the manner advised in the Pharmacopœia. In this mode the first doses may be given in ten or fifteen minutes. In the mean time, however, the moist peroxide prepared according to the Pharmacopœia should be given, and if recently prepared it may be sufficient ; but for the reasons adduced by Mr. Procter it is advisable, that the recent oxide should always be administered, especially where the amount of poison taken has been large.†

The form for its preparation admitted into the last edition of the Pharmacopœia of the United States (1842), is the following : Take of *Sulphate of iron*, ℥iv. ; *Sulphuric acid*, f.ʒiijss. ; *Nitric acid*, f.ʒvj., or a sufficient quantity ; *Solution of ammonia*, a sufficient quantity ; *Water*, Oij. Dissolve the sulphate of iron in the water, and, having added the sulphuric acid, boil the solution ; then add the nitric acid in small portions, boiling the liquid for a minute or two after each addition, until the acid ceases to produce a dark colour. Filter the liquid, allow it to cool, and add solution of ammonia in excess, stirring the mixture briskly. Wash the precipitate with water, until the washings cease to yield a precipitate with chloride of barium, and keep it in close bottles with water sufficient to cover it.‡

EFFECTS ON THE ECONOMY.

If a solution of arsenious acid be decomposed by freshly precipitated oxyhydrate of iron suspended in water, traces of arsenic can no longer be detected in the filtered liquid, made acid and tested by a stream of sulphuretted hydrogen gas. To throw

* Amer. Journ. of Pharmacy, April, 1842, p. 37.

† Procter, loc. citat.

‡ Pharmacopœia of the United States, p. 112. Philad. 1842.

down one part of arsenic, in this manner, requires a quantity of the oxyhydrate, which contains at least ten or twelve parts of oxide of iron. Yet, even where a smaller quantity is employed, the arsenious acid is almost wholly separated, as a stream of sulphuretted hydrogen gas affords only very slight traces of sulphuret of arsenic in the filtered and acidulated liquid. When the substances are previously heated, or the arsenious acid is exposed in small portions to the precipitating agent, the reaction is still slighter. If a few drops of ammonia be added to water in which the oxyhydrate of iron is suspended, and the mixture be digested with finely powdered arsenious acid, an insoluble arsenite of iron is formed; a circumstance, which would encourage the belief—even had it not been sanctioned by experience — that freshly prepared oxyhydrate of iron may serve as an antidote to arsenic: the union between it and arsenious acid forming — as has been seen — an insoluble compound, devoid of all poisonous influence on the economy, and only exciting gastric oppression, when given in large doses.

Accurate microscopical investigation, in experiments on animals that had taken arsenious acid in the solid form mixed with the oxyhydrate, exhibited to the discoverer of the antidote, that under the influence of animal heat and the peristaltic motion, it had become completely converted into arsenite of iron, and thus rendered innocuous. Such was the result of the observations of Boulet,* Orfila, Chevalier, Lassaigne, Soubeiran and Miquel† Nonat, Borelli and Demaria,‡ Lesueur, Boulay, fils,§ Monod,|| Von Spées, Mackenzie,¶ D. MacLagan** and others.†† On the other hand, the experiments of Brett,‡‡ Reginald Orton,§§ and Cramer, were unfavourable; but Messrs. Bunsen and Berthold remark, that the experiments of those gentlemen could not be expected to be successful, as they were made with doses of arsenic of from two to nine grains; and the stomach of the rabbit cannot retain more than from one-ninth to one-half the quantity of the antidote prepared according to their formula, which is necessary to neutralise that quantity of the poison.||||

Messrs. Bunsen and Berthold, from the results they have obtained, recommend the oxyhydrate as the chief antidote in all

* Gazette Médicale de Paris, 1834.

† Bullet. Général de Thérap. Dec. 1834.

‡ Br. and For. Med. Rev. April, 1836, p. 594.

§ Journal Hebdom. des Progrés des Sciences Médic. Mars 14, 1835.

|| Gazette Médicale, Aug. 22, 1835, and Annales d'Hygiène, &c. xiv. 134.

¶ London Lancet, April 4, 1840.

** Edinb. Med. and Surg. Journal, July, 1840.

†† See T. R. Beck, Amer. Journ. of the Medical Sciences, July, 1841, p. 90.

‡‡ Lond. Med. Gaz. xv. 220.

§§ Lancet, Nov. 8, 1834.

|||| See, also, Dr. MacLagan, op. cit.

cases of *poisoning by arsenic*; and they advise emetics to be associated with it—along with the agents hitherto employed; first, when the quantity of the poison taken has been considerable, and, therefore, a very large quantity of the antidote is demanded; secondly, when, at the same time, substances containing tannic acid, as infusion of green tea, or sulphuretted hydrogen, developed after the eating of eggs, may be suspected in the alimentary canal,—as these substances are closely related to the antidote, and may weaken its action; and, thirdly, when, prior to taking the poison, the stomach has been overloaded with food, and is, therefore, capable of receiving only a small quantity of the antidote.

But, whether vomiting may be excited or not, recourse must be had to the oxyhydrate as speedily as possible. Tepid mucilaginous drinks may also be given to envelope the particles of arsenic that may exist in the compartments of the stomach. If the quantity of the poison taken be unknown, the antidote may be administered in a considerable dose, and if the patient should vomit, it may be exhibited afterwards in smaller quantity. But, if no vomiting should arise, it is recommended that he should continue to take the oxyhydrate until the arsenite of iron formed has had time to pass into the intestinal tube; and even after this it may be persevered with in small doses for a time, as portions of arsenic may possibly remain behind unchanged. With the same view, the oxyhydrate may be thrown up in the way of clyster, whenever it is presumable, that the compound, formed by the oxyhydrate and the arsenic, has reached the lower portion of the bowels. To aid this, cathartics may be administered. Of these, castor oil, which would first suggest itself, might interfere, it has been conceived, with the operation of the antidote. Sulphate of magnesia, or any of the neutral salts, should have the preference.

The antidote may be given suspended in water. Experience has shown Messrs. Bunsen and Berthold, that from ten to twenty parts of hydrated oxide of iron are more than sufficient to convert one part of arsenious acid into the basic salt of iron.

As the quantity of arsenic in the stomach and intestines can scarcely ever be appreciated, it is considered by them advisable to allow the patient to take as large doses of the oxyhydrate as the stomach can tolerate; and it is of essential importance that it should be taken as hot as it can be borne. When the arsenious acid has been swallowed in the undissolved state—in the form of powder, or in larger or smaller pieces—it is necessary, in order to aid its solution, and to effect a speedy union with the oxide of iron, to add a small quantity of pure ammonia to the antidote, until a slight alkaline reaction is evinced. As the ammonia does

not enter into the composition of the salt formed, and, consequently, only plays a secondary part, ten or twenty drops may be sufficient for the purpose.

In the uncertainty as to the precise quantity of poison that has been taken, it has been recommended, that to an adult a table-spoonful, and to children a dessert-spoonful, should be given every five or ten minutes until relief from the urgent symptoms is obtained.*

The various experiments that have been instituted on animals have shown the protective power of the hydrated oxide: it must be borne in mind, however, in all such experiments made on dogs, that they readily reject the poison by vomiting; but if the poison be retained in the stomach by a ligature passed round the œsophagus, it exerts its accustomed deleterious effects.† It would seem, also, that the same result occurs if the dose of the arsenic be too small to induce vomiting. The animal may then die of the poison.‡

It would appear, that cases have occurred, in which this antidote has saved the lives of some, who might have been destroyed without its agency. Buzorini§ had a case in which about thirty-five grains of arsenic had been swallowed, and where it was successful, although twenty-four hours had elapsed since the poison had been taken; but this cannot be regarded as very satisfactory, inasmuch as the patient might probably have been saved by ordinary means. In another case, which was also treated by the antidote at a late period, marked alleviation of the sufferings was induced. Three cases are related by Majesté, two by Bineau,|| one by Benoist, and one by Geoffroy,¶ of Paris, which were treated successfully in the same manner. The subject of the last was a hair-dresser, thirty-five years of age, who, in a paroxysm of delirium tremens, swallowed a dram and a half of arsenic. Half an hour afterwards the antidote was given, suspended in water. He drank, in twelve hours, all the hydrated oxide produced by the decomposition of five ounces and five drams of the sulphate of iron. He had no violent colic; and, twenty-four hours afterwards, experienced scarcely any uneasiness.

* T. R. Beck, Amer. Journ. Med. Sciences, July, 1841, p. 95.

† MM. Miquel and Soubeiran, *Bullet. Général de Thérapeutique*, Dec. 1834. See on this subject, Dr. Joseph E. Muse, in *Dunghison's Amer. Med. Intelligencer*, for April 2, 1838.

‡ Dr. Robert B. Hall, in *Amer. Med. Intelligencer*, for Sept. 15, 1838, p. 181.

§ *La Lancette Française*, Nov. 17, 1835.

|| *Journal des Connaissances Médico-Chirurgicales*, Nov. 1835.

¶ *Journal de Méd. et de Chirurg. Pratiq.* Sept. 1835; and *Brit. and For. Med. Rev.* April, 1836, p. 572.

A successful case has, also, been related by Mr. John Robson, house-surgeon to the Warrington Dispensary.*

Dr. Richard H. Thomas, of Baltimore,† has published a case, in which it was believed that twenty grains of arsenic had been taken, which was relieved by the hydrated oxide, administered six hours after the poison was swallowed: there was no vomiting; but thirst, burning pain, and exquisite tenderness at the epigastrium existed, denoting endogastritis. Half a fluid ounce of hydrated oxide, which was in the wet state, and about the consistence of thick cream, was given in a tumbler of cool water, and the dose was directed to be repeated every ten or fifteen minutes in two ounces of water: eight ounces of the suspended oxide were taken in the twenty-four hours, after which the patient seemed free from disease. "The length of time — six hours" — says Dr. Thomas, "before any very severe symptoms supervened, and before the antidote was administered, at first caused me to think that the patient might have been deceived. Professor Von Spécs, of Vienna, however, asserts, 'that a dram of arsenic, in powder, does not produce its deadly effects on the system in less than six or eight hours, while the same quantity, dissolved in warm water, destroys life in a much shorter time.' In the present instance, it was swallowed in a dry state, covered with sugar. The prompt relief, which followed the exhibition of the peroxide, is also confirmatory of the impression that the poison was really taken."

A case has been published by Dr. Deville,‡ which was treated by this remedy, but as the patient vomited much, and the vomited matters were not examined, it is doubtful what was its agency. Between five and six hours elapsed before it could be procured. These remarks apply still more forcibly to a case reported by Dr. Chaloner,§ the subject of which took at eight o'clock, P.M., about half an ounce of arsenic, after which he vomited incessantly, and did not take the hydrated oxide until three P.M., on the day following. He got well; and the vomiting appeared to be relieved by it.

More recently, several cases of the successful exhibition of the hydrated oxide have been published; one by M. Ansroul, of Brussels;|| seven by Puchelt,¶ of Heidelberg; one by Dr. Mac-

* London Med. Gaz. Nov. 5, 1836; also, Amer. Journ. of the Med. Scien p. 222, May, 1837.

† Dunglison's Amer. Med. Intel. for July 16, 1838, p. 167.

‡ Revue Médicale Franç. et Etrangère, Sept. 1838; see, also, Br. and For. Med. Rev., and Johnson's Med-Chir. Rev. for April, 1839; and Amer. Journ. of the Medical Sciences, May, 1839, p. 243.

§ Medical Examiner, Apl. 18, 1840, p. 251.

|| Annales de la Société de Médecine de Gand, Avril, 1840, and Encyclographie des Sciences Médicales, Mai, 1840, p. 494.

¶ Heidelberg Medicinisch. Annal. B. v.; and Encyclographie des Sciences Médicales, Mai, 1840.

donald;* one by Dr. Chilton;† and one by Dr. Murray,‡ of India. Drs. Smiley and Wallace,§ of Philadelphia, administered it to a family of eight persons. Death followed in two cases. The antidote could not be retained by them, but was rejected immediately. In all the other cases, which recovered, the symptoms were mitigated.

As recommended in the Pharmacopœia of the United States, the hydrated oxide should be kept in the shops, ready mixed with a definite quantity of water, in order that it may be always at hand, so as to be administered without delay; and the recommendation is good. Even if not to be trusted to alone, the evidence is quite sufficient to show, that it ought to be regarded as an important element in the treatment of every case in which arsenic has been taken.

A commission of the Académie Royale de Médecine,|| composed of MM. Deville, Sandras, Nonat and Guibourt, recommend that four ounces of dry hydrated oxide of iron, the subcarbonate of iron of the shops or sesquioxide of iron, should be suspended in twenty-four ounces of water, and a good glassful of the mixture be taken every ten minutes. After four ounces are consumed, fresh doses of the same mixture may be administered in like manner, and the patient should not be considered out of danger, until he has taken at least half an ounce of the peroxide for each grain of arsenious acid supposed to have remained on the stomach.

Instead of the pure hydrated oxide, Von Spécs¶ employed substances in which the peroxide is known to exist in considerable quantity, and which require no previous preparation, as rust of iron, and hæmatite, (*red iron ore*), and, from his experiments, he is led to conclude, that although these substances do not prevent all the bad effects of arsenic on the system, they may — in the absence of the hydrated oxide — be employed as antidotes to that poison. The rust of iron has the advantage of being readily procurable.

A case has been published by M. Batilliat,** which induced him to infer, that the hydrated oxide, dried in the air, is as efficacious as that which is kept moist. It certainly would seem that the dry hydrated oxide — the *Ferri Subcarbonas* of the Pharmacopœia of the United States (1842) — possesses the power to

* New York Journal of Med. and Surg. iii. 205.

† Ibid. p. 54.

‡ Calcutta Med. Journ. Dec. 1837, and Amer. Journ. of the Med. Sciences, Feb. 1839, p. 503.

§ Philad. Med. Examiner, iii. 679.

|| Revue Médicale, Mai et Juin, 1839.

¶ Med. Jahrbücher des k. k. ö. St. B. xix. S. 621. Wien, 1836; and Ibid. B. xx. S. 149. Wien, 1836. See, also, Brit. and For. Med. Rev., July, 1837, p. 237; and Amer. Journ. Med. Sciences, Feb. 1838, p. 519.

** Journal de Chimie Médicale, Janvier, 1840.

a considerable extent of neutralizing arsenious acid;* and hence it ought to be used in the absence of the moist and fresh preparation. The latter, however, as already remarked, may be obtained in a condition fit for use in 10 or 15 minutes, by using a solution of the persulphate of iron.† The experiments of M. Guibert‡ would seem to show, that the subcarbonate of iron, as ordinarily prepared, is about three times less active in neutralizing arsenic than the dry hydrate prepared with ammonia, and six times less active than the same hydrate in the moist state.

A case has been published by Dr. Späth, of Esslingen,§ in which the hydrated oxide was administered as an antidote to Scheele's green — *Arseniate of Copper*. A boy, three years of age, poisoned himself by licking a shell covered with the poison. Half an hour afterwards, he became pale: violent vomiting soon came on, with diarrhœa, pain in the abdomen and burning thirst. The hydrated oxide was given in divided doses in warm water, and in half an hour the vomiting, diarrhœa, colic and thirst had ceased, and the next day all the symptoms had disappeared.

LXXIV. FERRI PROTOCARBONAS.

SYNONYMES. Ferri Carbonas, Protocarbonate of Iron, Carbonate of Iron.

French. Protocarbonate de Fer.

German. Salzsäures Eisen.

Precipitated carbonate of iron contains but little carbonic acid, — the remainder being chiefly peroxide of iron. The name has indeed been changed — in the last London Pharmacopœia — to “sesquioxide of iron.” The protocarbonate readily absorbs oxygen, and, consequently, becomes converted into the sesquioxide; and this is an objection commonly urged both against the *Mistura Ferri Composita*, and the *Pilulæ Ferri Compositæ*, of the Pharmacopœias. M. Vallet has discovered a method of obviating the objection, which consists in mixing the protocarbonate with saccharine matter.

* Dr. T. R. Beek, loc. citat.

† W. Procter, Junr., Amer. Journ. of Pharm. Apl. 1842, p. 37, and the Report of the Committee of the College of Pharmacy on his paper, Ibid. p. 39.

‡ Bullet. Général de Thérap. Dec. 1841, and Amer. Jour. of the Medical Sciences, Oct. 1842, p. 490.

§ Journ. des Connaissances Medico-Chirurg. Mars, 1840. Archives de Médecine, Février, 1842; and Journal de Pharmacie, Mars, 1842, p. 269.

MODE OF PREPARING.

The following method is given by Mr. Procter* as a simplification of M. Vallet's process. Take of *Protosulphate of iron* (pure) 16 parts; *Carbonate of soda* (crystallized) 19 parts; *Pure honey*, 9 parts; *Syrup*, a sufficient quantity. Dissolve the sulphate in half a gallon of water, at the temperature of 180° Fahrenheit, and the carbonate of soda in a like quantity; to each of these solutions add four ounces of syrup; and then mix them in a jar, which should afterwards be entirely filled with sweetened water, and the access of air be prevented. After the precipitate has subsided, decant the supernatant fluid, and then wash it with sweetened water, in the jar, until deprived of the adhering sulphate of soda. After the carbonate is thus purified, throw the precipitate on a flannel cloth; express forcibly, and mix it with the honey. The mixture should then be reduced by evaporation as rapidly and carefully as possible to a pilular consistence. The mass constitutes the "*Ferruginous Pills*," of M. Vallet.

The following form, founded on the above, has been introduced into the Pharmacopœia of the United States (1842).

Pilulæ ferri carbonatis.

Pills of carbonate of iron.

(*Vallet's Ferruginous Pills.*)

Take of *Sulphate of iron*, $\bar{\text{ss}}$ iv.; *Carbonate of soda*, $\bar{\text{ss}}$ v.; *Clarified honey*, $\bar{\text{ss}}$ iiss.; *Syrup*, *Boiling water*, each a sufficient quantity. Dissolve the sulphate of iron and carbonate of soda, each, in a pint of the water, and to each solution add a fluid ounce of syrup; then mix the two solutions in a bottle just large enough to contain them, close it accurately with a stopper, and set it by that the carbonate of iron may subside. Pour off the supernatant liquid, and, having washed the precipitate with warm water, sweetened with syrup in the proportion of a fluid ounce of the latter to a pint of the former, until the washings no longer have a saline taste, place it upon a flannel cloth, and express as much of the water as possible; then immediately mix it with the honey. Lastly, heat the mixture by means of a water bath, until it attains a pilular consistence.

A formula for the FERRI CARBONAS SACCHARATUM is introduced into the last edition of the Edinburgh Pharmacopœia. On

* The American Journal of Pharmacy. Jan. 1839, p. 272.

the continent of Europe the preparation is known under the name of Klauer's *Ferrum Carbonicum Saccharatum*.*

When prepared in this manner, the protocarbonate has a dark olive colour, strong ferruginous taste, contains about 30 *per cent.* of protoxide of iron, and if carefully prepared dissolves wholly and directly in acids.

EFFECTS ON THE ECONOMY.

The pills of M. Vallet have been prescribed in most of the diseases in which chalybeates in general are considered to be indicated; and especially in *chlorosis* and *amenorrhœa*.† It has been affirmed, that in cases in which the alterative effects of iron are proper, Vallet's preparation is superior to any other derived from that metal.‡ This can only be decided therapeutically; and as yet the trials have been too few. The author has exhibited it freely, but has not had reason to assign it any pre-eminence. It is certainly preferable to any other form of preparing the protocarbonate for medical use, in consequence of its stability, but it has to be determined, whether the conversion into the sesquioxide renders it less efficacious as a medicine. Bland, as will be seen presently, says distinctly not. Fifteen grains of this preparation have been observed to occasion sickness; and ten grains twice a day have produced headache and a sense of fullness in the head.§ The author has never witnessed such effects from its administration.

MODE OF ADMINISTERING.

The mass of pilular consistence, described above, may be made up into pills, each weighing three grains, and containing somewhat less than a grain and a half of protocarbonate.

They may be given to the extent of eight or ten pills daily, and be continued for weeks, if necessary.

A medicine, which greatly resembles the *Pilulæ Ferri Compositæ* of the Pharmacopœias, and in which the iron, when it is

* Pereira, Elements of Materia Medica, &c. 2d edit. p. 861, Lond. 1842.

† Soubeiran, Rapport sur les nouvelles pilules ferrugineuses de M. Vallet, in Bulletin Général de Thérapeutique, Mai, 1838, and in Amer. Journal of Pharm. x. 214. See also Berthemot, in Bull. Général de Thérapeut. Juillet, 1839.

‡ Wood and Bache's Dispensatory of the United States, 4th edit. p. 1170. Philad. 1839.

§ Christison, Dispensatory, p. 426. Edinb. 1842.

newly prepared, is in the state of protocarbonate, has acquired great celebrity in the south of France, on account of its beneficial effects in *chlorosis*. It is given in the form of pill, and is called after its inventor, — Dr. Blaud, senior physician to the Hospital of Beaucaire, — “BLAUD’S PILLS.”

Blaud’s formula for the preparation of his pills is as follows : — Take of *Gum tragacanth*, in powder, six grains; *Water*, one dram. Macerate in a glass or porcelain mortar, until a thick mucilage is formed; and if it be desired to prevent the formation of peroxide of iron, and to make the pills similar to those of Vallet, substitute — says M. Blaud — a dram of powdered sugar for the mucilage. Add, afterwards, of *Sulphate of iron*, in powder, half an ounce. Beat well, until the mixture is quite homogeneous; and add *Carbonate of potassa*, half an ounce. Beat until the mass, which soon becomes of a yellowish-green colour, passes to a deep green, and assumes a soft consistence. Divide into 48 pills; which M. Blaud considers sufficient for the cure of a chlorotic patient.*

M. Giubourt substitutes the bicarbonate for the simple carbonate or subcarbonate; and he gives as reasons: *First*, The avoidance of a very alkaline salt, an excess of which may not prove beneficial to the stomach; and *Secondly*, The formation of a double carbonate of potassa and iron, which is, of all the compounds of iron, the most fitted for absorption by the economy, as it is not only soluble, but not astringent. His form is the following: — Take of pure crystallized sulphate of iron, crystallized bicarbonate of potassa, each four drams; powdered gum Arabic, one dram; powdered marshmallows, half a dram. Mix and divide in ninety-six pills.†

A proper objection made to these pills is their excessive size; and farther it has been urged, that a chemical change quickly occurs in the mass; the carbonate of the protoxide being, after a short time, converted into the sesquioxide of iron.‡ Blaud,§ however, maintains properly, that the virtues of medicines cannot be appreciated from chemical experiments: “It is,” he remarks, “to therapeutical trials, and not to chemical experiments that we must have recourse, to learn accurately the medical properties of any agent. What signifies it to practitioners that my pills contain little or no protoxide of iron, provided that they cure chlorosis?” To prove that they do possess this power, Blaud adduces a long list of cases in which a cure was obtained in three or four weeks.

* *Revue Médicale*, Mars, 1832, Dec. 1838.

† *Pharmacopée Raisonnée*, i. 383; and *Amer. Journal of Pharmacy*, April, 1839, p. 61.

‡ Soubeiran, *Bull. Général de Thérap.* Mai, 1838.

§ *Ibid.*

To prevent, however, the change to which the chemists object, but which Blaud appears rather to regard with favour, M. Adorne has suggested the addition of sugar and the pulvis althææ, according to the following form:—Take of *Sulphate of iron*, recently prepared, according to the method of Bonsdorff,* which is a pure sulphate; *Carbonate of potassa*, or what is better, *Carbonate of soda*; *Powdered root of the marshmallow* and *Sugar*, each, half an ounce; *Mucilage of gum Arabic*, as much as is sufficient. Make into ninety-six pills, which must be covered with a very fine layer of gum and sugar, aromatized with essential oil, to correct the disagreeable odour.†

With similar views, M. Simonin, of Nancy, has proposed the following formula for the preparation of Blaud's pills, which he considers has the double merit of prompt and easy execution, and of furnishing pills which keep without undergoing alteration. Take of *Protosulphate of iron* and *Pure carbonate of potassa*, each equal parts. Reduce them separately to a fine powder; mix accurately, by triturating them together until they begin to liquefy; then add enough clarified honey to give the mixture complete liquidity: afterwards heat the mass over a very gentle fire, until it has acquired the pilular consistence. The process was repeated by M. Félix Boudet‡ by employing pure crystallized sulphate of iron, 100 grammes;§ pure carbonate of potassa, 100 grammes; white honey, 50 grammes; from which he obtained 130 grammes of a deep green mass, very ductile and easily rolled into pills, as M. Simonin had said. The addition of the honey prevents the farther oxidation of the iron.

M. Blaud commences with his "antichlorotic pills," in the dose of one a day; and, in the course of a few days, gives two, and afterwards three, daily.

Mr. Donovan|| recommends the protocarbonate of iron to be administered in the following manner, for extemporaneous use:—*Blue sulphate of iron*, in fine powder, half an ounce; *Calcined Magnesia*, two scruples; *Water*, six ounces; *Tincture of quassia*, two drams. Divide into six draughts, one to be given night and morning.

Mr. Carmichael, of Dublin,¶ has recommended the following mode of exhibiting the precipitated carbonate:—Take one dram of *Bicarbonate of soda*; dissolved in four ounces of *Springwater*,

* See Dr. Bache, in Wood and Bache's Dispensatory, 4th edit. p. 906. Philad. 1839.

† Bulletin Médical du Midi, Janvier, 1839; Encyclographie des Sciences Médicales, Mars, 1839.

‡ Journal de Pharmacie, Mars, 1841, p. 153.

§ A gramme is gr. 15.444 Troy.

|| Dublin Journal of Medical Science, Mar. 1840, p. 159.

¶ Dublin Medical Press, March 4, 1840.

and add a drachm of *Tincture of chloride of iron*. This draught to be taken three times a day during effervescence. Mr. Carmichael remarks, that although the quantity of carbonate of iron formed is not considerable, yet it is in such a state of minute subdivision, and combined with a solution of chloride of sodium equally minute,—"the saline most congenial to the system of red-blooded animals, as it renders the hematosine active and vivifying," that he always found it answer the object of a chalybeate thus given much better than the large doses of from one to two drachms of the subcarbonate. If ulceration existed, he found it very generally improved; and he has seen many cases of *lupus* attacking the face cured by its joint internal and external use. He formerly thought the phosphate of iron possessed of superior advantages to the carbonate administered internally; but now thinks the carbonate given during precipitation answers every purpose of a chalybeate, without causing any derangement of stomach.

LXXV. FERRI SUBCAR'BONAS.

SYNONYMES. F. Carbonas, F. Carbonas Præcipitatus, Ferrum Carbonatum Præcipitatum, Ferrum Carbonicum Oxydulatum, Oxydum Ferri Fuscum, F. Oxidum Rubrum, Deuto-carbonas Ferri Fuscus, Crocus Martis Aperiens, Ferri Sesquioxylum, Subcarbonate of Iron, Sesquioxide of Iron, Peroxide of Iron.

French. Souscarbonate de Fer, Safran de Mars Apéritif.

German. Kohlensaure Eisenoxydul.

This preparation, which is officinal in the British, United States and other Pharmacopœias, is formed by adding a solution of carbonate of soda to a solution of sulphate of iron: the precipitate is the subcarbonate, or, as — it is now called in the London Pharmacopœia — the *sesquioxide of iron*, which must be washed with water, and dried.

EFFECTS ON THE ECONOMY.

Subcarbonate of iron possesses the properties of the chalybeates in general, and has been highly recommended as a tonic, wherever such remedies are indicated. It is introduced here, mainly on account of the favour which it has received, of late years, as a remedy for *neuralgia*. Thirty years ago, its use was strongly advised in *cancer* and *carcinomatous ulcerations*

† Dublin Medical Press, Mar. 4, 1840.

of the uterus, by Mr. Carmichael;* and, subsequently, by Rust, Völker, and Kopp; as well as in a case of *lupus of the ala nasi*, by Key:† but, in similar cases, it proved unsuccessful in the hands of Clarke, El. Von Siebold, Meissner, Richter, and others.‡ In *chronic nervous diseases, of a spasmodic nature*, and especially in *tic douloureux of the face*, it was first highly extolled by Mr. Benjamin Hutchinson, about twenty years ago,§ who published several cases of cure effected by its agency. Soon afterwards, cases, equally fortunate in their termination, were published by various observers, by Drs. A. T. Thomson,|| Stewart Crawford,¶ R. Macleod,** Mr. J. E. Beale,†† and many others, and its efficacy is now almost universally admitted. Dr. Rowland‡‡ has often witnessed the most happy results from its exhibition, even after various powerful medicines had been tried in vain.

Dr. Elliotson§§ published several cases, in which the remedy, in large doses, had been efficacious; and he remarks, that *true chronic neuralgia*, not arising from cold, and coming on in a violent, stabbing, plunging form, aggravated by the least shake of the patient, and by touching the surface, is best treated by subcarbonate of iron. He observes, however, in a recent publication,||| that he does not recollect that he ever cured the disease, but in almost every case improved it, and caused it to disappear for a time. In one of the severest cases of neuralgia under the form of *hemicrania*, which the author ever witnessed, and which had rendered the patient's life miserable for years, the subcarbonate of iron, in large doses, proved entirely successful. The patient had been bled repeatedly; and when the author saw her, she was under the most favourable circumstances for the exhibition of the remedy,—with the surface pale and cool; the pulse small; complaining much of debility, and yet suffering under the most intense headach, which the least light and noise rendered almost intolerable; yet, after she had persevered in the use of the remedy

* An Essay on the Effects of the Carbonate and other Preparations of Iron upon Cancer. 2d edit. Dublin, 1809.

† Lancet, xiv. 92.

‡ Osann, in Encyclopäd. Wörterb. der Medicinisch. Wissenschaft. x. 424. Berlin, 1834.

§ Cases of Tic Douloureux successfully treated. Lond. 1820.

|| Medical and Physical Journal, Feb. 1823.

¶ Ibid.

** Ibid. June 1823.

†† Ibid. Sept. 1823.

‡‡ Treatise on Neuralgia, by Richard Rowland, M.D., p. 84. Lond. 1838; and the reprint in the author's American Medical Library.

§§ Medico-Chirurgical Transactions, xv. 161.

||| Principles and Practice of Medicine, &c. by John Elliotson, M.D.; with Notes, &c. by Nathaniel Rogers, M.D. p. 507. Lond. 1839.

for a month, in large doses, the symptoms gradually disappeared, and she has since remained entirely well. It need scarcely be said, that where plethora exists, or febrile irritation supervenes, it must be removed; the subcarbonate rarely, however, disagrees with the stomach, and where it does, the inconveniences are removed by the addition of an aromatic, or the administration of a cathartic.

Subcarbonate of iron, in large doses, has, likewise, been found a valuable agent in a kindred condition of the nervous system — *chorea*. Dr. Elliotson* affirms, that he has had — he should suppose — forty cases, in succession, all cured by it; but perseverance in its use is demanded, the affection generally disappearing when the remedy has been given about six weeks or two months; but in some obstinate cases it has been necessary to continue it for twelve weeks.

Like other tonics, it has been prescribed in *intermittents*, and not long ago, M. Gimon,† physician at Thouars, published two cases, elucidative of the effects of large doses in *long protracted intermittents, complicated with ascites and enlargement of the spleen*. One of these occurred in a boy, nine years old, and the other in a young man of twenty-one. Both had taken the sulphate of quinia in large doses, but ineffectually. To the former, he prescribed twelve grains of the subcarbonate in the twenty-four hours, augmenting the dose by six grains daily. The treatment was commenced in the latter end of July, 1835, and the quantity taken in the day was pushed progressively to one ounce. In six months the traces of ascites and splenocele had disappeared, and the cure was complete. The medicine was discontinued by gradually diminishing the dose. In the second case, the same dose was prescribed, in the first instance; and it was ultimately carried to six drams, with complete success.

More recently still, Dr. Steyman‡ has recommended the subcarbonate in the treatment of *hooping-cough*, in the dose of half a grain at the least, to be taken every three hours with sugar, and increased to as many grains as, and more than, the number of years of the child's age. It should not, he advises, be administered in the first stage of the disease; and, in all cases, should be preceded by an emetic.

The great efficacy of this preparation — as of every tonic — in diseases that are paroxysmal, appears to consist in the new impression, which it makes upon the nerves of the stomach, and, through them, upon those of the whole system; but to effect the

* Op. citat. p. 515.

† Journal des Connoissances Médico-Chirurgicales, Mai, 1837.

‡ Medicin. Correspondenz-Blatt, and Gazette Médicale de Paris, June 20, 1838.

revulsion to the requisite extent, it appears to be necessary — as in the cases of artemisia and indigo in epilepsy — to keep up the effect of the remedy by gradually increasing the dose.

MODE OF ADMINISTERING.

The dose of subcarbonate of iron, in cases of neuralgia and chorea, should be large. Mr. Hutchinson prescribed it in the quantity of ℥ss. to ʒij., twice a day; but where it fails to remove the complaint in those doses, Dr. Elliotson recommends, that it should be increased gradually to one or two ounces. The best vehicle for it is melasses. The following formulæ have been recommended :*

Pulvis ferri subcarbonatis.

Powder of subcarbonate of iron.

R. Ferri subcarb. gr. x.

Pulv. aromat. gr. v.

M. Fiat pulvis manè et meridiè sumendus.

Boli ferri subcarbonatis.

Boluses of subcarbonate of iron.

R. Ferri subcarb. gr. x.

Valerianæ pulv. ℥ss.

Syrup. zingib. q. s.

Fiat bolus.

Pilulæ ferri subcarbonatis.

Pills of subcarbonate of iron.

R. Ferri subcarb.

Extract. anthemid. āā. ℥ss.

Misce et divide in pilulas xij. quarum sumat binas ter quotidie.

R. Ferri subcarb. ʒj.

Pilul. aloes cum myrrhâ, ℥ss.

Misce et divide in pilulas xvij. : duæ bis terve indies sumendæ.

* Brande, Dictionary of the Materia Medica, p. 248. Lond. 1839.

Electuarium ferri subcarbonatis.

Electuary of subcarbonate of iron.

R. Ferri subcarb.

Confect. aurant. āā. ʒj.

Syrupi zingib. q. s.

ut fiat electuarium cujus sumatur cochleare minimum bis vel ter die.

LXXVI. FILIX MAS.

SYNONYMES. Nephrodium Filix Mas, Aspidium Filix Mas, Athyrium Filix Mas, Polypodium Filix Mas, Filix, Male Fern, Male Shield Fern.

French. Fougère Mâle.

German. Farrenkraut, Johanniswurz.

The rhizome of male fern, which is indigenous in this country, and in the secondary list of the Pharmacopœia of the United States, has long been celebrated — since Dioscorides indeed — as an anthelmintic; and especially for the destruction of *tænia*.* For these properties, it has been introduced into most of the Pharmacopœias. It was the basis of Madame Nouffer's celebrated remedy for tænia, which was purchased by Louis XVI. in 1775, for 18,000 francs. It is noticed here, on account of the proposition of Peschier,† of Geneva, to administer the **ETHERAL EXTRACT**, which has since been carried into effect, and apparently with the best results. It appears to possess the advantage of being by no means unpleasant to the taste, and to be accompanied by none of the disagreeable effects, that are associated with the action of most of the other vermifuges.

To prepare the extract, the *root* is cut small, and digested for ten or twelve days, in the cold, in a sufficient quantity of *sulphuric ether*, — the tincture is then pressed, concentrated by distillation, and the ether thereby fully removed. From a pound of the root, about eighteen drams of a brownish-green, thick extract are obtained, which possesses the repulsive odour of the plant, and has an acrid taste.

In Germany, the extract is generally prepared according to the formula of the Prussian Pharmacopœia, which is as follows —

* Merat and De Lens, Dict. de Mat. Med. Art. Polypodium.

† Nouvelle Bibliothèque Médicale, Sept. 1828, p. 151, and Biblioth. Univer. xxxi. 324, 1826.

Take an ounce of the *powdered root*, and pour thereon eight ounces of the *sulphuric ether* of commerce; close the vessel, shaking it occasionally, and let it stand until the fluid has acquired a yellowish colour; then separate the fluid as before described; distil off the sulphuric ether until only a third remains, and evaporate the remainder, in a water bath, until a thin brownish-yellow coloured extract remains.

This extract contains not only the volatile oil of the fern, but also a fixed oil, tannic acid, acetic and gallic acids, a muco-saccharine matter, green and red colouring matter, and a semi-resinous substance. By some it is called *OLEUM FILICIS MARIS*. The active constituents of the fern are highly concentrated in it; and as the result of numerous trials, it was found, that from eighteen to twenty grains, given at night, and the same quantity in the morning, fasting, destroyed *tænia*; so that on the administration of a cathartic, the parasite was discharged — often in the form of a ball. Not unfrequently, indeed, it was voided before the cathartic was given.

In Germany, this new preparation has been chiefly recommended by Hufeland, who maintained, that in rapidity, certainty and gentleness of action, it exceeds all known means, and many other physicians have testified to the accuracy of this opinion. Radius,* who frequently prescribed it, says he never gave it without bringing away large pieces of the worm, but frequently the head remained behind.†

Peschier had found it to be successful in 150 cases when he wrote;‡ Ullersberger had used it in 60 cases, and a medical friend of his in 200 cases, with invariable success. It is affirmed to have proved more successful in cases of *Bothriocephalus latus* than of *Tænia solium*; and a part of the discrepancy of results amongst observers has been ascribed to this circumstance. For example, it has not been found as effective in the treatment of *tænia* at Paris, and the *tænia* most common there is the *Tænia solium*.§

Buchner|| thought, that the extract might be prepared with alcohol, but many physicians have objected to this menstruum,—that it does not dissolve the fixed oil.

The male fern is preferred by M. Rouzel¶ to the bark of pomegranate root in the treatment of *tænia*.

* Auserlesene Heilformeln, u. s. w. Leipz. 1836.

† See, also, Ebers, in Hufeland and Osann's Journal, lxvi. St. 1. S. 43, and Gazette de Santé, Sept. 25, 1828.

‡ Merat and De Lens, loc. cit.

§ Christison, Dispensatory, p. 451. Edinb. 1842.

|| Repertorium für Pharmacie, xxiii. 433, xxvii. 337, and Funk, in Medicin. Zeitung, Mai 17, 1837, S. 102.

¶ Revue Médicale, Oct. 1840. See, also, M. Wawruch, Oesterreich. Med.

MODE OF ADMINISTERING.

The extract is commonly given in the form of pill: an emulsion does not answer, because the active constituents are apt to be enveloped and masked in this form. In Geneva, it is now frequently united with castor oil, which renders it unnecessary to give a cathartic after it. For the cathartic, when needed, they advise, in Bern, infusion of senna with epsom salts, manna, and aniseed.* To children, it may be given in syrup.

An *ethereal tincture of the buds* (one part of the buds to eight of *ether*) has been used with advantage as an anthelmintic;† and a *decoction* (one ounce of the *rhizoma* to a pint of *water*) has been occasionally prescribed.

Mel. filicis maris.

Honey of the male fern.

R. Ext. æther. filicis maris, ℥ss.

Mel. rosæ, ℥ss. M.

Half of this to be taken on going to bed: the other half early in the morning fasting.

LXXVII. FUCUS AMYLA'CEUS.

SYNONYMES. Ceylon Moss, Marine Moss.

The attention of physicians has been directed to this vegetable by Dr. O'Shaughnessy, of Calcutta.‡ Like Chondrus (p. 160), it belongs to the NATURAL ORDER Algæ, and was first introduced, some years ago, into India and England. As met with in commerce, it is white, filiform, and fibrous, and has the usual odour of seaweeds. When analysed by Dr. O'Shaughnessy, it was found to be composed as follows:—Of vegetable jelly, 54.50;

Jahrbuch, cited in Encycl. des Sciences Méd. Nov. 1841, p. 264; and M. Daurie, Archives de la Méd. Belge, Sept. 1841, p. 5.

* Hufeland und Osann's Journal, lxi. St. 1. S. 133.

† London Lancet, for 1834–5, ii. 597.

‡ Medico-Botan. Transactions, vol. i. pt. iv. p. 184.

true starch, 15; wax, a trace; ligneous fibre, 18; gum, 4; sulphate of soda, and chloride of sodium, 6.50; sulphate and phosphate of lime, 1; iron, a trace; loss, 1:—Total, 100. When boiled in water, a liquid results, which gelatinizes on cooling.

EFFECTS ON THE ECONOMY.

The medical properties of *fucus vesiculosus* are similar to those of *chondrus*. The decoction is an agreeable, light, nutritious article of food. According to Dr. O'Shaughnessy, its nutritive qualities are best obtained in the following manner:—Put into a clean stewpan a tablespoonful of prepared marine moss, add to it a pint and a half of hot or cold water, and boil gradually for twenty minutes; then take a little in a spoon, and let it cool for a minute or two to see if the liquid is sufficiently boiled to congeal firmly; if not, let it boil until it is; then strain it through a cloth into another stewpan while it is warm, so as to draw all the liquid from the sediment produced by the moss. The sediment must be well squeezed. Add to the liquid a tablespoonful of fine loaf sugar, half a tablespoonful of lemon juice, a tablespoonful of honey, or not, at the option of the maker; add a small piece of lemon peel, and a very small piece of cinnamon: boil the whole gradually for ten minutes, and pass it once or twice through a piece of flannel into a basin or tumbler, and in ten minutes it will be fit for use. Should it be required to be very clear and transparent—which is not considered necessary for an invalid, as by clarifying it partly loses its strength—add the white of an egg, well beaten into froth, before the second boiling; taking care, that after the second boiling it rests for some minutes by the fireside, with some hot charcoal on the cover of the stewpan so as to render it perfectly clear; otherwise, by adding the whole of an egg, it will have a milky-white appearance, which is not so pleasing to the eye, although its quality may be the same. When clear, and of a lemon colour, it may be passed two or three times through a flannel bag. It may then be suffered to cool, or be taken in a liquid state, if preferred by the patient.

The jelly is as good for the table as for the sickchamber. Blanc-manger and Italian cream can be made with it without isinglass; but in such case, the jelly must be made much stronger before it is mixed; and at all times it must be blended whilst warm. The quantity it takes for a mould of either is two tablespoonfuls of moss to a quart of water, which must be reduced to half a pint.

Ceylon moss has the advantage over isinglass and the other mosses, that it will stand firm and good for twenty-four hours

in the hottest days of India ; whilst neither isinglass nor any other jelly will stand firm for half an hour, even with the aid of ice. It also possesses the advantage, that a delicious jelly can be made from it in about fifteen or twenty minutes.

The Ceylon moss has been pronounced by all the medical faculty of Calcutta to be unequalled for its delicate and nutritious qualities, and it has been especially and highly recommended for the use of the sick. When all other nourishment has failed, this has proved successful ; and Dr. O'Shaughnessy says he has no doubt that when the article is better known by the faculty in England, it will be much more appreciated, and receive the same patronage and support, which it has done from the whole of the faculty in India for the last fifteen or sixteen years.*

LXXVIII. FULI'GO.

SYNONYMES. Fuligo Splendens, F, Ligni, Soot, Woodsoot.

French. Suie.

German. Glanzruss, Spiegelruss, Kaminruss, Ofenruss, Russ.

The discovery of creasote, and its extensive application to the treatment of disease, gave occasion to the resuscitation of this article — much employed by the ancients, but subsequently fallen into oblivion.

The older physicians frequently used soot as an exciting diaphoretic agent in *cachexiæ* of every kind, in *chronic rheumatism*, *cutaneous affections*, and especially in the evil results of their sudden repercussion ; in *glandular indurations*, *rickets*, *exostoses*, &c. It has also been employed as a domestic remedy, in *colic*, and in the *simple and dysenteric diarrhæa*, and *cholera of children*. Several modern recommendations — as by Schütte and Weisenberg — remained unheeded until the attention of physicians was recently drawn to it, especially by Bland.† He is of opinion, that the costly — and by no means easily prepared — creasote may be wholly replaced by soot. Both are products of the dry distillation of organic substances ; their odours are analogous, and as soot is much cheaper and more easily obtained, it deserves, he thinks, to be tried more extensively in therapeutics.

* Braithwaite's Retrospect of Pract. Med. and Surg. No. 1, Jan. to June, 1840, 3d edit. p. 70. Lond. 1842 ; and Drs. Sigmond and Farre on the Ceylon Moss, Lond. 1840.

† Revue Médicale, Juin, 1834, et Janvier, 1835, and Dr. E. Gräfe, in Gräfe und Walther's Journal, xxiii. 310. Berlin, 1835.

The soot has a nauseously empyreumatic, more or less bitter, and acrid, saline taste.

EFFECTS ON THE ECONOMY.

Blaud* has exhibited soot in different diseases, especially in the form of ointment, or in decoction, with excellent and rapid effects, in *herpes*, *itch*, *tinea*, *gutta rosacea*, and *pruritus vulvæ*; and he asserts, that he even healed a *cancer of the breast* by frequent ablution with a tepid decoction of it, and an ointment composed of equal parts of lard and soot with one-eighth part of the extract of belladonna; but the same applications were of no benefit in the case of cancer of the nose, and in one of cancer of the uterus. He also cured a *scabby eruption of the mucous membrane of the nose* by an ointment of soot. In *diphtheritis*, he used, in two cases, a decoction, as a mouth-wash, with the best effects.

In confirmation of Blaud's remarks, Voisin asserts, that he cured a case of *cancer of the face* by soot ointment.

Dr. J. R. Marinus† has found it very efficacious in *chronic eruptions (dartres)*, and in *tinea*; and his observations have been confirmed by MM. Nobelet‡ and Lemontagnier.§ M. Nobelet's conclusions are, — 1. That soot cannot be applied with any expectation of success, until the crusts have been removed, and the irritation of the parts has been diminished by means of emollient applications. 2. That the gray layer, left by the soot on the skin, whether it be used in the form of ointment or of decoction, should be removed by a weak wash of soap and water. 3. That in children an ointment, made with equal parts of soot and lard, is frequently too irritating for the small wounds exposed by the falling off of the crusts; that it is better to commence with one part of soot to three parts of lard; and, lastly, that wood soot is alone useful; soot from coal being devoid of any agency.

Dr. Ebers, of Bourdeaux,|| has employed a decoction of soot with great advantage in a case of severe burn in which the patient was suffering from the profuse discharge. A handful of soot was boiled in eight pounds of water, until the fluid was re-

* Journal des Connaissances Médico-Chirurg. Mai, 1834.

† Bulletin Médical. Belge, Nov. 1838, p. 289.

‡ Annales de la Société de Médecine de Gand, Gazette Médicale, and Encyclographie des Sciences Médicales, Mars, 1840, p. 540.

§ Bullet. Génér. de Thérap. Nov. 1840, and Encycl. des Sciences Méd. Fév. 1841, p. 299.

|| Journ. de Méd. et Chirurg. Pratiq. Juin, 1841, cited in Amer. Journ. of the Med. Sciences, Jan. 1842, p. 231.

duced to two pounds. Lint was then soaked in it, and applied to the granulating surface.

Carron du Villards* advises a collyrium prepared from soot in cases of *strumous ophthalmia*. He infuses two ounces in boiling water, filters and evaporates to dryness; the shining residuum is then infused in very strong *boiling vinegar*, and to every twelve ounces of the liquid, twenty-four grains of *extract of roses* are added. A few drops of this solution, in a glass of tepid water, form an excellent resolute collyrium, which may be made stronger or weaker at pleasure. He has, also, in cases of *spots on the cornea*, used soot — either blown into the eye alone, or mixed with powdered sugar-candy, and has seen good effects from it. United with butter, it forms an eyesalve, not inferior perhaps, he says, to any other. As, in the treatment of *specks on the cornea*, by dropping laudanum into the eye, the organ quickly becomes accustomed to it, Carron du Villards advises, that the eye should be excited to a more lively action by means of the combination of soot and tincture of opium given below. It is, he says, an energetic agent and may be applied by means of a pencil to granulations on the cornea. He likewise recommends a decoction of soot as an injection in *discharges, which are the consequence of chronic inflammation of the vagina*.

More recently, M. André Gibrin† has detailed to the Académie Royale de Médecine of Paris, six cases of *chronic inflammation of the bladder*, in which soot was beneficially used in the way of injection. M. Gibrin took from the chimney two ounces of compact soot, broke it up, washed it, and boiled it in a pound of water. The decoction was filtered through paper, and injected into the bladder twice a day. The good effects supervened so closely on the administration of the remedy, that there could be no doubt as to the cause. The pain ceased, and the patient obtained sleep, to which he had been for some time a stranger. The urine gradually became clear, and recovered its natural appearance.

To these remarks it may be added, that, according to Schütte, an ointment composed of two parts of fresh butter or hog's lard, and one part of soot — is a popular and efficacious remedy on the Rhine for cases of *porrigo*, *itch*, and *herpes*; not more than a dram being rubbed in at a time. Weisenberg ascribes to the soot a protective power against contagious affections of the skin, and recommends, especially, lotions of soot water, — partly as a preventive agent, and partly as a therapeutical application in *itch*.

* Gazette Médicale, Janvier, 1831; see, also, Baudelocque, on its Use in Scrophulous Ophthalmia, in Bulletin Général de Thérapeutique. Mars, 1834.

† Bulletin de l'Académie, 15 Mars, 1837.

But soot has not been used, of late, externally only; its internal use, in the form of the old "*tincture of soot*," has been revived. This was long known under the name of "*soot drops*," "*hysteric mixture*" and "*fit drops*," and was employed as an antispasmodic in *hysterical and other affections*; but its employment has been extended, and it is given in *chronic rheumatism, chronic affections of the chest, suppressed cutaneous eruptions*,—in many cases under precisely the same notions that prevailed years ago. From thirty to sixty drops of the following tincture are given several times in the course of the day.

MODE OF ADMINISTERING.

Mistura fuliginis.

Mixture of soot.

Tinctura Fuliginis (Clauderi).

R. Fulig. ℥ss.

Potassæ carbonat. ℥iss.

Ammoniæ carb. ℥ij.

Aq. sambuc. ℥ix.

Digere leni calore. Filtra.

Dose. — From thirty to sixty drops several times a day.

Lotio fuliginis.

Lotion of soot.

R. Fulig. manip. maj. ij.

Coque cum. aq. Oi. per semihoram. Cola cum expressione.

Used as a wash, several times a day, in *herpetic, psoric and syphilitic ulcers*. *Blaud.*

Unguentum fuliginis.

Ointment of soot.

R. Fulig.

Adipis, āā. ℥ss.

Extract. belladon. ℥j. M. exactè.

To be spread upon lint or tents in cases of *cancers*.

Blaud.

R. Adipis,
Fulig. āā. ℥ij.
Coque leni igne per horas vj.

As a dressing in cases of *tinea*, and of *foul ulcers*.

Blaud.

R. Carbon. pulv.
Sulph. āā. ℥j.
Fulig.
Cinchon. flav. āā. ℥ss.
Cerati simplicis q. s. ut fiat unguentum.

A dram to be rubbed in, once or twice a day, in cases of
tinea. *Carron du Villards.*

R. Opii, ℥ij.
Caryoph. ℥j.
Fulig. ℥ss.
Aq. cinnam. f.℥viij.
Alcoholis, f.℥iv.

Digest in a gentle heat for six days ; filter and express the residuum.

Applied in cases of *specks of the cornea*.

Carron du Villards.

R. Fulig. ℥ij.
Album. ovi, No. vj.

Tere simul.

As a dressing for *herpes* and *tinea*. It is the *Pommade resolutive* of Sainte Marie.*

R. Fulig. ℥iss.
Zinci sulphat. ℥vj.
Adipis, ℥iv. M.

Applied in cases of *tinea*. It is the *Pommade contre la teigne*, of Bories.†

* Nouveau Formulaire Médicale et Pharmaceutique. Paris et Lyon, 1820.

† Formulaire de Montpellier. Montpellier, 1822.

LXXIX. FULIGO'KALI.

This new remedy called from *fuligo*, 'soot,' and *kali*, 'potassa,' has been introduced as an analogous preparation to *anthrakokali* (p. 57).*

MODE OF PREPARING.

Fuligokali is prepared as follows:—Take of *Potassa*, 20 parts; *Shining soot*, in powder, 100 parts; *Water*, a sufficient quantity. Boil for an hour; suffer the decoction to cool; dilute with water so that filtration may be better accomplished; filter, evaporate, and dry, in order to obtain the fuligokali in scales or powder; and inclose it in dry and warm bottles.

A SULPHURETTED FULIGOKALI has been prepared as follows:—Take of *Fuligokali*, 60 parts; *Potassa*, 14 parts; *Sulphur*, 5 parts. Dissolve the sulphur and potassa in a little water; then add the fuligokali; evaporate, dry, and enclose it in dry and warm bottles.

EFFECTS ON THE ECONOMY IN DISEASE.

Fuligokali has been employed by M. Gibert at the Hôpital Saint-Louis of Paris, both internally and externally; but chiefly in the latter mode, in various *chronic cutaneous diseases*. An ointment may be made of either the simple or the sulphuretted article; by mixing one or two parts with thirty of lard. M. Gibert ascribes to these ointments, resolvent, detergent and slightly excitant virtues.†

Mr. E. Wilson‡ thinks it probable, that both anthrakokali and fuligokali owe much of their therapeutic value to the alkali, which forms their basis. He has employed fuligokali in several cases, and especially in *psoriasis palmaris*, and with better success than he has obtained by the usual remedies. What might be regarded as a weak solution of fuligokali has been used for many years in Philadelphia by Drs. Physick,

* Journ. des Connaissances Méd. Chir. and Encyclogr. des Sciences Médical. Juillet, 1842, p. 9.

† See, also, A. Duhamel, Amer. Journ. of Pharmacy, Jan. 1843, p. 284.

‡ A Practical and Theoretical Treatise on the Diagnosis, Pathology, and Treatment of Diseases of the Skin, p. 397. Lond. 1842.

Dewees and others, under the names of *medical lye*, *soot tea*, *alkaline solution*, and *dyspeptic lye*.*

LXXX. GALEOP'SIS GRANDIFLO'RA.

SYNONYMES. Galeopsis Ochroleuca, G. Villosa, G. Segetum, Herba Sideritidis.

German. Grossblüthigen Holzhahns, Grossblumigte Handfnessel.

This plant, which belongs to NATURAL FAMILY Labiatæ, SEXUAL SYSTEM Didynamia Gymospermia, grows in the western part of Germany, in sandy cornfields.†

EFFECTS ON THE ECONOMY.

The fresh plant has a peculiar, feeble, balsamic smell, and a somewhat bitter and saltish taste, and has been considered, in Germany, to be worthy of a distinguished place amongst the "bitter resolvents." It has been much sold as a nostrum, under the name of "Blankenheimer Tea," (*Blankenheimer Thee*), or "Liebers pectoral and phthisical herbs," (*Liebersche Brust oder Auszehrungskräuter*), and enjoyed great repute. In the Ardennes, also, particularly in the district of Malmedy, it has been long employed as a popular remedy. In the year 1828, Lejeune‡ directed attention to the therapeutical importance of this plant. According to his observation, it is very useful in *diseases of the mucous membrane of the respiratory and digestive organs*, and especially in *chronic pulmonary catarrh*, even when it exists to such a degree as to merit the name *Phthisis mucosa* (*Schleimschwindsucht*). In *actual phthisis*, the affection seemed to him to be diminished by it; the hectic being moderated, the expectoration rendered easier, or the cough assuaged.

Lejeune generally boiled half an ounce of the *plant* in a pint of *water* down to half; sweetened the decoction with *sugar* or *honey*, and directed the whole to be taken in the twenty-four hours. In other cases, in which a milk diet was appropriate, the decoction

* A. Duhamel, op. cit.

† Von Schlechtendal, in Encyclopäd. Wörterb der Medicin. Wissenschaft. xiii. 115. Berlin, 1835.

‡ Annales Générales des Sciences Physiques, p. 331. Sepr. 1820.

was made with an equal quantity of milk. Wesener* found it advantageous in *phthisis mucosa* and in *chronic pulmonary catarrh*. Günther, who had many opportunities for observing the action of the remedy, affirms, that the *Lieberschen Kräuter* not unfrequently produced some amelioration in *phthisis*, especially in *scrophulous phthisis* but he never saw any actual recovery therefrom. It seemed to him to moderate the *colliquative sweats*, and to facilitate and diminish the expectoration. In one case especially, of *scrophulous phthisis* in the last stage, it appeared to be of essential service, and to prolong life; and from all his observations he is disposed to infer, that if it be not the sole or the main remedy to be employed in every stage of *phthisis*, it may be used with advantage throughout the disease as a supporting agent.

Rieckel asserts, that he has seen many cases in which the *Lieberschen Kräuter* were of great service in *thoracic affections threatening phthisis*. In one case, which promised to terminate unfavourably in a short time, owing to the complication of violent *hæmoptysis with hectic fever*, and in which an experienced physician had exhausted every effort of art, they were given with the best effect. The thoracic affection ceased, and at that time — a period of five or six years since the use of the remedy — the patient — an officer — was capable of performing his military duties without difficulty. On the other hand, Richter affirms, that in two cases in which he administered the galeopsis, no benefit resulted from it. In this country, it has not been employed; so that we can only judge from the testimony afforded by the German writers. This, as they themselves admit,† is not yet sufficient to enable them to lay down any positive rules as to the exact indications and counter-indications that must regulate its employment. It is probably of no farther service than as a mild bitter; and its place may, therefore, be supplied, perhaps advantageously, by many of the tonics that are admitted into the lists of our remedial agents. Geiger§ subjected it to analysis, and found in it 2,765 parts of fatty matter, wax and chlorophylle; 0.247 of a brown bitterish resin, insoluble in ether; 0.312 of a yellowish stimulating and bitter resin, soluble in ether; yellow bitter extractive matter, soluble in ether, and a brownish matter insoluble therein; phosphate and malate of lime; salts of potassa; muco-saccharine matter and fecula, and 65.882 of ligneous matter.

* Hufeland und Osann's Journ. der Pract. Heilk. 1823 and 1824.

† Die neuern Arzneimittel, u. s. w. S. 241. Stuttgart, 1837.

‡ Ibid.

§ Magaz. für Pharmacie, ix. 134.

METHOD OF ADMINISTERING.

Decoctum galeopsidis grandifloræ.

R. Galeopsid. grandifl. summitat. $\bar{3}$ j.
Coque in Aquæ Oj. per minut. xv. et cola.

To be used in the twenty-four hours. *Wesener.*

R. Galeop. grandifl. summitat.
Althææ, aa. $\bar{3}$ j.
Glycyrrhiz. $\bar{3}$ ij. M.

A fourth part of this to be boiled in a pint and a half of water; and to be used daily in *chronic catarrh*, and in the expectoration produced by the softening of pulmonary tubercles.

*Radius.**

The *galeopsis versicolor*, and the *galeopsis villosa*, which have also been examined by Geiger,† appear to be possessed of the same virtues as the *galeopsis grandiflora*.‡

LXXXI. GALVANIS'MUS.

SYNONYMES. Electricitas Animalis, E. Galvanica seu Metallica, Irritamentum Metallorum seu Metallicum, Galvanism, Voltaism, Galvanic Electricity.
French. Galvanisme.

The ordinary effects of common and galvanic electricity and of electro-magnetism are so well known, as to require but little comment. They are decidedly excitant; and, like all excitants, when applied to a part of the frame, are counter-irritant or revellent. All have been employed in *paralysis*, — general and local, — *amaurosis*, *deafness and dumbness of recent duration*, *asthma*, *rheumatism*, *neuralgia*, *amenorrhæa*, § &c. The effect, however, which galvanism exerts on the contractility of the muscular fibre, and the great similarity, in its agency, to the nervous

* Anserlesene Heilformeln, u. s. w. S. 274. Leipz. 1836.

† Allgem. Med. Annalen, S. 1141. 1825.

‡ Richter's Specielle Therapie, B. x. S. 397. Berlin, 1828.

§ G. Bird, Guy's Hospital Reports, April, 1841, p. 84.

influence,* has led to its employment more frequently in the various nervous and spasmodic diseases referred to, and in others belonging to the same class.† Resting on his views of the absolute identity between the nervous and galvanic fluids,‡ Dr. Wilson Philip employed it in many diseases, and especially in *asthma*. In a paper read by him before the Royal Society of London, in January, 1816, he details some experiments, which he made on rabbits. The eighth pair or pneumogastric nerves were divided by incisions made in the neck. After the operation, the parsley, which the animals had eaten, remained unchanged in their stomachs, and after evincing much difficulty of breathing, they seemed to die of suffocation. But when, in other animals, whose nerves had been divided, the galvanic agency was transmitted along the nerve, below its section, to a disc of silver, placed closely in contact with the skin of the animal, opposite to its stomach, no difficulty of breathing occurred. The galvanic action being kept up for twenty-six hours, the rabbits were then killed and the parsley was found digested.

The removal of *dyspnœa*, in these cases, led Dr. Philip to employ galvanism as a remedy for asthma; and, by transmitting its influence from the nape of the neck to the pit of the stomach, he gave decided relief in every one of twenty-two cases, of which four were in private practice, and eighteen in the Worcester Infirmary. The power employed varied from ten to twenty-five pairs of plates. Since then, galvanism has been repeatedly used in such cases, and at times with marked relief. Commonly, however, the plates, described hereafter, are employed for this purpose. The disease, in the majority of cases, appears to be dependent upon erethism of the pneumogastric nerves; all the phenomena indicating that there is a spastic constriction of the small bronchial tubes, occasioned by irritation at the extremities, or in the course of the nerve. The new impression, made by the galvanic agency, breaks in upon the concentration of nervous action, by exciting other portions of the nervous system, in the same manner as we observe spasms or ordinary cramp relieved, or paroxysmal diseases warded off, by agents that are capable of suddenly impressing some part of the nervous system.

Not long after these researches of Dr. Philip, galvanism was employed satisfactorily by Mr. Mansford§ in a congenerous disease — *epilepsy* — and his plan was afterwards — although

* See the Author's Physiology, i. 88, 3d edit. Philad. 1838.

† Pereira, Elements of Mat. Med. 2d. edit. p. 42. Lond. 1842; or Amer. Edit. by Dr. Carson, Philad. 1843. See, also, the Author's General Therapeutics and Mat. Med. i. 511. Philad. 1843.

‡ Experimental Inquiry into the Laws of the Vital Functions, Lond. 1817.

§ Researches into the Nature and Causes of Epilepsy, &c., Bath, 1819.

tardily — extended to some other paroxysmal disorders. The mode of application, recommended by Mansford, is as follows :

A portion of the cuticle, of the size of a sixpence, is removed by means of a small blister on the back of the neck, as close to the root of the hair as possible, and a similar portion is removed from the hollow beneath, and on the inside of, the knee, as the most convenient place. To the excoriated surface on the neck, a plate of silver, varying — according to the age of the patient — from the size of a sixpence to that of half a crown, is applied, having attached to its back part a handle or shank, and to its lower edge — and parallel with the shank — a small staple, to which the conducting wire is fastened. This wire passes down the back, until it reaches a belt of chamois leather, buttoned round the waist ; it then follows the course of the belt to which it is attached, until it arrives opposite the groin of the side on which we desire to employ it ; it then passes down the inside of the thigh, and is fastened to the zinc plate in the same manner as to the silver one. The apparatus, contrived in this way, is thus applied. A small piece of sponge, moistened in water, and corresponding in size to the blistered part of the neck, is first placed directly upon it ; over this, a large piece of the same size as the metallic plate, also moistened, is laid, and next to this, the plate itself, which is secured in its situation by a strip of adhesive plaster passed through the shank in its back ; another above, and another below it. If these be properly placed, and the wire, which passes down the back be allowed sufficient room that it may not drag, the plate will not be moved from its position by any ordinary motion of the body. The zinc plate is fastened in the same manner, but in place of the second layer of sponge, a piece of muscle answering in size to the zinc plate is interposed ; — that is, a small piece of moistened sponge being first fitted to the exposed surface below the knee, the piece of muscle moistened, or — what has been found equally effectual and less inconvenient — a piece of moistened flannel* follows, and on this the plate of zinc.

The apparatus, thus arranged, will continue, according to Mr. Mansford, in gentle and uninterrupted action from twelve to twenty-four hours, according to circumstances. “ This last is the longest period that it can be allowed to go unremoved ; the sores require cleaning and dressing, and the surface of the zinc becomes covered with a thick oxide, which must be removed to restore its freedom of action : this may be done by scraping or polishing ; but it will be better if removed twice a day, both for the greater

* Dr. Chapman says soft buckskin or parchment. *American Journal of the Medical Sciences*, Aug. 1834, p. 311.

security of a permanent action, and for the additional comfort of the patient."

The adoption of this plan of treatment in cases of *tic douloureux*; the confidence reposed by Laennec in the use of plates on the breast and back in *angina pectoris*, and similar *neuralgic affections of the chest*; and the communications of Drs. Harris and Chapman, brought it into extensive use, so that ample trial was given to it in this country, both in public and private practice. In three cases, it was — to employ the language of Professor Chapman* — "triumphantly directed" by Dr. Harris; but it was only found effectual in affections of the face; and in these cases it had to be persevered in for some time before marked benefit was experienced.† About the same period, this mode of applying galvanism was recommended by Dr. Miller,‡ of Washington University, Baltimore, and a case of *paraplegia* and another of *general paralysis* were published by him, in which it was found highly efficacious.

More recently, Dr. Hays has stated, that the most useful remedy in certain cases of *amaurosis*, which fell under his care,§ was unquestionably galvanism. This was evinced not only in the improvement, which followed its application, but in the "still more striking fact," that the patient saw better whilst subjected to the galvanic action. Dr. Hays found a Cruikshank's battery of fifty pairs of plates three inches square — when in full activity — too powerful for the purpose, so that only one-half or two-thirds of the plates were usually employed. The connexion was made by means of leaden wire conductors, to one end of which was soldered a slip of copper, and to the other a hemisphere of brass, the flat surface of which was filed into grooves crossing at right angles, so as to form a number of sharp points. Over these were tied thin discs of sponge, which were kept moist with a solution of common salt, and when it was considered desirable to introduce strychnia into the system, the sponge attached to the negative pole — and sometimes that to the positive pole, also — was moistened with a solution of it.

When the whole force of the battery was not wanted, instead of placing the slips in the extreme cells, they were placed in cells more or less remote, according to the power required; and the force was easily regulated.

The galvanic current may be made to pass from the mastoid process to the superciliary ridge.

Dr. Hays expresses his persuasion, that galvanism, properly

* Op. citat. p. 311.

† Dr. Harris, in Amer. Journal of the Medical Sciences, Aug. 1834, p. 384.

‡ Ibid. p. 321.

§ American Journ. of the Medical Sciences, Aug. 1840, p. 288.

employed, is a valuable and effective remedy for certain forms of amaurosis.

Electro-magnetism was tried by him in several cases in Wills' Hospital, and in a number of cases in private practice; but without its seeming to be productive of the slightest benefit in a single instance; whence he infers, that, for remedial purposes, a regular and constant galvanic current would appear to be more useful than the violent shocks produced by interrupted currents, such as are induced by the electro-magnetic apparatus.

There are doubtless — as already observed — cases of disease, in which the excitant and revulsive agency of galvanism may be employed with advantage, but they are not so numerous as was at one time believed. The author has used the plates extensively — in neuralgic cases especially — but has not experienced so much success, as to induce him to advise them frequently, under the inconveniences that necessarily accompany their employment. They are, indeed, at this time, but little used.

Some years ago, Professor Von Hildenbrand, of Pavia,* recommended, in cases of *frontal neuralgia* an *anodyne metallic or galvanic brush*, which appears to have been as effectual in his hands as the galvanic plates in those of Dr. Harris. It consists of a bundle of metallic wires not thicker than common knitting-needles, firmly tied together by wire of the same material, so as to form a cylinder of about four or five inches long, and an inch or three-fourths of an inch in diameter. This is applied to the pained part, which has been previously moistened with a solution of common salt; and, according to Von Hildenbrand, it at times produces relief so instantaneous, that it appears to the patients to act like a charm. In his first experiments, he employed brushes constructed of two kinds of metal, — for instance, of silver and copper wire, copper and zinc wire, or zinc and brass wire, the individual wires being mutually commingled; but he subsequently ascertained, that bundles of wires of one and the same metal produced an effect scarcely less speedy, and that solid metallic bodies act in a similar manner, but in a much feebler degree. The nature of the metal he thinks occasions no difference.

It is not probable, that, in these cases, galvanism is the agency concerned. Like the metallic tractors of Perkins, the effect is probably induced by the new nervous impression made through the excited imagination of the patient.

ANIMAL MAGNETISM.—*Mesmerism, Neurogamia, Biogamia, Biomagnetismus, Zoomagnetismus, Tellurismus, Exoneurism*, as it has been termed — exerts an anodyne influence in probably

* Edinburgh Medical and Surgical Journal, April, 1833.

the same manner. In highly impressible persons, more or less prolonged impressions made upon the senses — as by the operator looking steadfastly in the eyes of the patient, holding the thumbs or hands at the same time, or making passes in front of the patient — will induce an hysteric or hysteroid condition, in which the patient may fall into what is called “*magnetic sleep*,” of a very sound, and at times cataleptic, character: during the existence of this sleep, the patient may be insensible to certain irritants, and yet extremely alive to others, so that operations — as the extraction of teeth, and even some of a more serious character — may be performed without eliciting the ordinary evidences of feeling. In cases of *delirium tremens*, accompanied by watchfulness, in which the whole nervous system is extremely impressible, sleep may be at times induced by the employment of this agency, which has resisted the ordinary anodynes.*

Of late years, it has been proposed to introduce into the rectum, in cases of constipation, a kind of *galvanic suppository*, made of two metals — zinc and copper — and various forms of instruments have been devised by the prolific imaginations of the inventors; those intended for the rectum simply were doubtless of advantage, at times, by virtue of the excitation they induced in the nerves of the mucous membrane. Others, formed somewhat like a bassoon — and so arranged as to have one metal in the mouth and the other in the rectum connected together by metal — did not appear to act differently from those of the simpler form. Both have gone into disuse, and — as has been said elsewhere† — if their efficacy on the frame has not been well marked, they have not failed to minister to the pockets of their inventors.

LXXXII. GENTIANA CHIRAYITA.

SYNONYMES. *Henricea Pharmacearcha*, *Swertia Chirayita*, *Agathotes Chirayita*, *Chiretta*, *Chirayita*.

Gentiana chirayita is a native of India, whence it is imported into England tied up in bundles. It has been long in use there.

* Dr. Vedder, in *Dunglison's American Medical Intelligencer*, Feb. 1, 1839, p. 331.

† *General Therapeutics*, p. 248, Philad. 1836, and *General Therapeutics and Mat. Med.* Philad. 1843.

EFFECTS ON THE ECONOMY.

The herb and root are intensely bitter, and produce on the economy the ordinary effects of the pure bitters. They strikingly resemble gentian, and are employed in India in *dyspepsia*, and as an antiperiodic in *intermittents*.* The plant has been highly extolled by Drs. Currie, Sigmond, and others. These gentlemen consider that the secretion from the liver improves under its use; and the latter advises it not only in *torpor of the digestive function*, but he prefers it to sarsaparilla where the latter is considered to be indicated, — as after large quantities of mercury have been taken, or where profuse salivation has been induced. It has also been advised in atonic *leucorrhæa*.

MODE OF ADMINISTERING.

Gentiana chirayita yields its virtues to alcohol and water. (*Gent. chirayit.* ζ ii.; *Aq. bullient.* Oss.). The *tincture* is made by macerating five ounces of the *chirayita* for fourteen days in two pints of *diluted alcohol*. Dose, a teaspoonful. The dose of the powder is one scruple.†

LXXXIII. GRANA'TI RADICIS CORTEX.

SYNONYMES. Punica Granatum, Malogranatum, Pomegranate (the bark of the root).

French. Grenadier, Balaustier.

German. Granatwurzelnrinde.

Punica Granatum appears to be a native of the northern coast of Africa, whence it was transported to Italy at the time of the Carthaginian wars. It is now cultivated in all civilized regions, where the climate is sufficiently warm to allow the fruit to ripen. It belongs to the NATURAL FAMILY Myrtaceæ, and, in the SEXUAL SYSTEM, to Icosandria Monogynia.

All the parts of the plant contain more or less tannic acid. The bark of the root is externally of a yellowish-gray or ash

* J. Johnson, Influence of Tropical Climates, 3d edit. p. 58.

† See "Note upon Gentiana Chirayita, by Dr. Carson, in Amer. Journ. of Pharmacy, new series, vol. vi. No. 1, Apl. 1840, p. 20.

colour; internally yellow, and has an astringent taste. According to Latour de Trie,* it contains wax, chlorophylle, a considerable quantity of resin, gallic acid, tannic acid, fatty matter, and a peculiar matter called *Grenadin*,—in German, *Granatin*.

Grenadin, in its pure state, is of a white colour; inodorous, and of a sweetish taste; so much so indeed, that, according to Magendie, it might be presumed to be a variety of sugar, except that it differs from ordinary sugar in being devoid of the property of fermenting. According to the degree of its purity, it crystallises in grains, tufts or stars. When thrown on red hot coals, it consumes without any residuum, and smells like burnt bread. It is fusible, and by a moderate heat may be almost wholly sublimed. It neither reacts as an acid nor an alkali, and is readily soluble in water. Cold alcohol dissolves only traces of it, but boiling alcohol dissolves it readily,—a property, which is to be taken advantage of in the formation of crystals. In ether it is insoluble. Nitric acid, with the assistance of heat, converts it into oxalic acid. An ounce of the bark yields six grains of grenadin; but it is not settled, whether it contains the whole of the medical properties of the bark. Cenedella,† from whom we have the most recent analysis of the bark of the pomegranate root, also found the grenadin discovered by Latour. This substance is readily prepared. The bark in powder is treated with ether, and afterwards with boiling alcohol, and the fluid is evaporated to the consistence of a soft extract. By treating this extract with water, grenadin is dissolved without difficulty, and it may be purified by suffering it to crystallise frequently from alcohol.

EFFECTS ON THE ECONOMY.

The therapeutical properties of the different parts of the pomegranate tree were known to the writers of antiquity. They employed not only the bark of the root as a remedial agent, but also the flowers (*Flores Balaustiorum*, *Balaustes*, *Balaustia*, *Balaustine Flowers*), the whole fruit (*Poma Granati*, *Malogranata*, *Granata*, *Mala Punica*, *Pomegranate*: Fr. *Grenades*), the rind of the fruit (*Malicorium*, *Malichorium*, *Malacorium*), and the seeds. Dioscorides, Pliny, Celsus and Marcellus Empiricus speak of the employment of the bark of the root in *tænia*.‡ In more modern times, *Punica granatum* had been greatly neglected, although the juice of the fruit was recommended by Frederick

* Journal de Pharmacie, Fév. 1828, p. 109.

† Giornale di Farmacia, Agosto, 1831, p. 55. See, also, Journal de Pharmacie, ix. 219; x. 352; and xvii. 503; and Prof. Dierbach, in Heidelberg. Klin. Annalen, B. x. H. 3, S. 365. Heidelb. 1834.

‡ Mérat and De Lens. Dict. de Mat. Médical. Art. *Punica Granatum*.

Hoffman against *worms* in children. In India, it has been long held in great estimation as a remedy in *tapeworm*, and its efficacy having been noticed by some English physicians, it was recommended to the attention of European physicians, especially by Buchanan,* Fleming and Breton.† About the same time, a monograph was published by Gomez, a Portuguese physician, which appears to have had considerable agency in extending the reputation of the remedy, especially in Germany, where the monograph was translated into the Journal of Gerson and Julius.‡ Gomez directs two ounces of the *fresh rind of the root* to be boiled in a pint and a half of *water* down to a pint; and of this decoction two or three spoonfuls to be taken for a dose; the first early in the morning fasting, and then every half hour until the whole is used. The efficacy of the preparation he tested in fourteen cases, from which it appeared, that the worm could not withstand its action more than forty-eight hours. He found it to exert most efficacy, when portions of the worm were perceptible in the evacuations, a period when the patient generally suffers most inconvenience. If the exit of the worm did not take place on the first day, after the use of the agent, the decoction was continued on the second day, when the worm was generally discharged. Did this, however, not happen, a farther continuance of the remedy was of no avail; and he thought it better to intermit it until the appearance of fresh portions of the worm in the evacuations. Gomez also administers the dried rind in pills. If the dose be too large, or the appropriate dose be too frequently repeated, nausea, vomiting and diarrhœa at times supervene: should this be the case, the proper course is obvious.

In countries, where the fresh rind can be obtained, Gomez advises, that it should be used; in colder countries, the dried rind, which is obtained from more southern regions, will have to be employed. According to Breton, the latter acts more powerfully. The dried rind loses more than half its weight, and two ounces of it may be esteemed equal to three of the fresh.

The strong testimony, adduced in its favour by Gomez, gave occasion to numerous trials with it in England, France, Germany and Italy, which were generally attended with favourable results. Such favourable testimony has been afforded by Boiti, Marchese, Calabro, Majoli, Chevallier, Deslandes, Mérat,§ Pichonnier, Mandrux, Claret, Bayle, Delaporte, Gendrin, Grimaud, Chapo-

* Edinb. Med. and Surg. Journal, iii. 22, 1827.

† Medico-Chirurg. Transact. xi. 31.

‡ Magazin, u. s. w. vi. 427, and Journal Complémentaire des Sciences Médicales, xvi. 24, 1823.

§ Du Ténia, &c. et de sa cure radicale par l'écorce de la racine de Grenadier. Paris, 1832; and Mérat and De Lens, Op. cit.

tin, Bourgeoise, Housson, Goupil, Ferrus, Wolff, Köstler, Meisinger, Berthold, and others.* On the other hand, Keibelt complains of its uncertainty; and, in the Polyclinical Institute of the University of Berlin, it was given without advantage; but Osann, in his report of that institution, is disposed to refer the want of success to some imperfection in the rind employed, which, he remarks, is found to vary greatly in its character, as met with in the shops of apothecaries. It would appear, also, that it is not unfrequently mixed with the rind of the root of the Boxtree, and Guelder rose.

To introduce more precision on this matter, Wolff recommends that the druggists should purchase the bark of the root of the genuine East India, or at all events the Portuguese, tree. Boiti† advises that the root should be obtained from mountainous regions, where the tree grows wild; that it should be taken only from young trees, and that it should not be more than an inch thick; that it should be carefully separated from the woody portion, and be collected in the spring of the year, when the tree has most sap, and be dried in the shade. Chevallier,§ also advises, that only the rind of the root of the wild tree should be used. Gendrin, Montault and Pichonnier affirm, that the fresh rind was alone certain in its operation; the dry frequently disappointing them. According to Breton, the rind of the trunk is to be preferred to that of the root, because it preserves its virtues longer. Chevallier recommends, before the decoction of the pomegranate tree bark is administered, that a gentle cathartic of castor oil with lemon juice should be premised. This may be taken the evening before, the patient fasting during the following day. He directs the decoction to be made of two ounces of the *rind* macerated for twenty-four hours, in two pints of *water*, and then boiled until a pint of the strained liquor remains. This must be divided into three portions, which are taken in half hourly doses. The first and second doses with many persons excite vomiting, but this need not prevent the administration of the third, as it rarely produces the same effect. This quantity of the decoction commonly occasions three or four evacuations, preceded by slight colic pains; at other times, but one evacuation is produced, with which the worm is usually expelled. The period that elapses between the administration of the last dose of the remedy and the commencement of its operation is from a quarter of an hour to a whole hour — rarely longer.

Cenedella advises, that the bark of the root should be macerated before boiling; that the decoction should be made in earthen, not in metallic, vessels, and that it should be filtered or strained

* Riecke, Die neuern Arzneimittel, S. 247.

† Rust's Magazin, xvi. St. 3. S. 566.

‡ Revue Encyclop. xxxii. 234.

§ Journal de Chimie Médicale, i. 378; 1825.

whilst hot,—different constituents, which are probably efficacious, being deposited as the liquor cools.

According to Constant, the decoction is commonly prepared in France in the following manner :—The *rind of the fresh root* — or the *bruised root dried* — is macerated through the night in from a pint and a half to a quart of *water* ; the liquor is then boiled to one-half, strained ; and, in the morning, a third part is taken lukewarm, fasting, and repeated every three hours until the whole has been administered. The quantity of the rind, used for the decoction, is, in the case of the adult, $\bar{3}j$. ; of children, from six to fifteen years old, $\bar{3}vj$; and of those under six years of age, $\bar{3}ss$. At times, however, it has been administered in much larger doses. A girl, twenty-four years of age, had suffered from *tænia* from her infancy, and had frequently passed fragments of worms in her evacuations. She took two ounces of the bruised bark of the pomegranate root, boiled in two pounds of water, at thrice, with half an hour's interval between the doses, but without effect. The dose was now increased to three ounces, and two tapeworms were expelled ; so that in two days, and without any abdominal disturbance, the patient took the decoction of five ounces of the bark of pomegranate root.*

To ensure the proper action of the decoction, it must be given as directed above, without the addition of sugar or syrup, which changes its properties. During its operation, the patient should drink nothing except when the tormina are urgent, and then a little of any aromatised water, without sugar, may be taken. The remedy should be given only on days in which portions of *tænia* are evacuated, or on the following morning ; and the alimentary canal should be free from every evidence of inflammatory irritation. By some, as by Latour de Trie and Ferrus, an infusion of the rind has been found serviceable ; and Deslandes recommends an *Extractum spirituosum*, and an *Extractum aquosum corticis radicis granati*.

Ferrus, Berthold, Goupil, and others, have published cases in which, along with the expulsion of *tænia*, various *neuroses* were removed under the use of the rind, and accordingly it has been thought, that it might be usefully employed in such affections where no *tænia* exists ; — in *epilepsy* and *hysteria*, for example.

Decoetum granati radiceis corticis.

Decoction of pomegranate root bark.

R. Granati radiceis corticis, $\bar{3}ij$.

Aquæ, Oij.

Boil to a pint and a half.

* Professor Forget, in Gazette des Hôpitaux, Fév. 19, 1839, and Lond. Med. Gazette, April 20, 1839.

Dose. — ʒij. every half hour. Three or four doses are usually sufficient to expel the *worm*.* The formula quoted by Dr. Parist from Dr. Ainslie's *Materia Medica of Hindostan*, directs the DECOCTION to be prepared with ʒij. of the *fresh bark*, boiled in a pint and a half of *water*, until only three-quarters of a pint remain.

Electuarium extracti granati radicis corticis.

Electuary of extract of pomegranate root bark.

R. Extract. alcohol. granat. rad. cort. ʒvj.
 Aquæ florum tiliaë,
 Succ. limon. āā. ʒiij.
 Tragac. q. s. ut fiat electuarium.

Dose. — One half, from half hour to half hour.

Deslandes.

Mistura extracti granati radicis corticis.

Mixture of extract of pomegranate root bark.

R. Extract. alcohol. granat. rad. cort. ʒvj.
 Aquæ menthæ,
 Aquæ flor. tiliaë, †
 Succ. limon. āā. f. ʒij. M.

To be divided into four parts, one of which may be taken every quarter of an hour.

Deslandes.

LXXXIV. GUACO.

SYNONYMES. Huaco, Eupatorium Huaco.

It would appear, that owing to some extracts in the *Allgemeine Zeitung* the attention of the German physicians had been directed to this article as an important agent in the cure of epidemic cholera; and various testimonials have been brought for-

* Jourdan's *Pharmacopée Universelle*, i. 638. Paris, 1828.

† *Pharmacologia*, Beck's American Edition, p. 380. New York, 1831.

‡ Any simple aromatic water may be substituted for this.

ward in its favour, which, as Riecke* properly suggests, may not be confirmed by farther experience, and yet the circumstance may have led to the introduction of a valuable article into the catalogue of medicinal agents.

Many species of the genus *Eupatorium*, and of the kindred genus *Mikania*, — which has been recently separated from it, belonging to the NATURAL FAMILY Compositæ (Synantherææ, subdivision Corymbiferæ), and, in the SEXUAL SYSTEM, to Syngenesia Æqualis, have been prized in various parts of America, particularly in cases of the *bites of serpents*. This is especially the case with *Eupatorium ayapana* (*E. triplinerve*). According to Von Martius, a quantity of the bruised leaves is applied to the scarified wound, and the application of fresh leaves is renewed, over and over again, until the patient is freed from the dangerous symptoms, and especially from the violent suffering. At the same time, a few spoonfuls of the expressed juice are administered every now and then. The *Mikania opifera* (*Eupatorium crenatum*), — in Brazil termed *Erva da cobra* — and the *Eupatorium saturejæfolium* (*Mikania saturejæfolia*), also belong to the many Synantherææ, which, in South America, are reputed specifics against the *bites of serpents*. The most important species appears to be that called, in Peru, *Guaco*, or *Huaco*, which is held there in high consideration, as well as in Columbia, New Grenada, and Venezuela, not only in these cases, but in the prevention of *hydrophobia*.† This is presumed to be the *Mikania guaco* of Humboldt. Dr. Hancock, however, affirms, that the names *Guaco* and *Bejuco de Guaco* were given — in the parts of America where he sojourned — to different species of *Aristolochia*.

Guaco was made known, forty or fifty years ago, by Mutis,‡ who refers to its effects in cases of the bites of serpents.

EFFECTS ON THE ECONOMY.

Of the efficacy of the guaco in the *Indian cholera*, M. E. de Chaniac, *Officier de Santé* in the French navy, and Dr. Chabert, physician to the military hospital in Mexico, have published the results of their experience. When the brig *Adonis*, on her voyage from Havana to Mexico, in the year 1833, arrived at Vera Cruz, some of her crew were attacked with cholera, which prevailed

* Die neuern Arzneimittel. u. s. w. S. 250. Stuttgart, 1837.

† See W. R. Johnson, in *Silliman's Journal*, xxiv. 279 and 388, New Haven, 1833; and *Ibid.* xxvii. 171, New Haven, 1835; also, Dr. Hancock, in *Quarterly Journal of Science*, &c. from January to June, 1830, p. 333.

‡ Virey, in *Bulletin de la Société de Pharmacie*, vi. 241; and Riecke, *Op. cit.* 251.

at the time in Mexico. Of all the remedies employed, the guaco was found most beneficial; its effects, indeed, were so wonderful, that it was regarded almost as a specific. Its action is chiefly exerted on the heart and the circulation, which it renders more energetic. All the patients, to whom it was exhibited in the commencement of the disease, were saved, and even of those, in whom the cholera had already reached a certain stage, the greater part were saved, as soon as a free and complete reaction was established.

Dr. Chabert, who first administered guaco in cholera, as well as in *yellow fever*, observes on its use in the former disease: — In simple cases, a small teacupful of a warm decoction of guaco was given every half hour, until a general diaphoresis and proper warmth of surface supervened, which was kept up for some days, when the remedy was gradually discontinued. To allay the thirst, the decoction was given, diluted with two-thirds, or half, water. In dangerous cases of cholera algida, with coldness, loss of pulse, &c., a spoonful of the tincture was mixed with six or eight spoonfuls of water, and, every quarter of an hour, a spoonful of this mixture was given alternately with a small cupful of the decoction. When the pulse returned, the warmth became restored and the perspiration re-established; the tincture was omitted, and the decoction continued alone at longer intervals. In the majority of cases, after the cessation of the cholera symptoms, pain was experienced in the epigastrium, with burning thirst, which yielded when the decoction was diluted with half or two-thirds water. When the decoction could not be retained by the stomach, it was given in clyster. Bloodletting, general and local, was employed along with other external means, but nothing was given internally, except the guaco. To make the DECOCTION; — two drams of the *stalks*, and half a dram of the *leaves*, were boiled in two pints of *water*, down to one. The TINCTURE was prepared like other tinctures.

In consequence of the communications of Chabert and De Charniac, as well as of the parallel drawn by Harless,* between the cholera and the effects of the bites of serpents, Professor Beckers, of München, recommended that experiments should be made with guaco; and it was accordingly tried in München, but not with as favourable results as had been expected. Romerio asserts, that it was given in the *stadium asphycticum*, in the form of INFUSION, made of half an ounce of the stalks, but with uncertain results. It appeared to combine the effect of valerian and ipecacuanha, yet it excited less vomiting than the latter. The tincture appeared to render greater service. It was given in the dose of a coffee-spoonful every half hour, and, subsequently, every hour, and

* Die Indische Cholera u. s. w. Braunschweig, 1831.

every two hours. It would appear, that in the district of Prague, its administration was attended with very favourable consequences.* To account for the different results, it is affirmed, that different drugs are met with in commerce under the name guaco. Riecke says, that M. Jobst had sent him two kinds, which were evidently from different plants: the one variety was obtained from Hamburg and Bordeaux; the other from Paris: descriptions of these are given by Riecke. The truth, probably, is, that this, like most of the cholera specifics which have been brought forward, is efficacious in certain cases of the disease, but that its agency has been egregiously exaggerated.

LXXXV. HIPPOCASTANUM (CORTEX).

SYNONYMES. *Æsculus Hippocastanum*, *Castanea Equina*, *C. Pavina*, Horse Chestnut, Buck Eye (the Bark).

French. Marronier, Marronier d'Inde.

German. Rosskastanien (Rinde).

The tree, whence this bark is derived, is the *Æsculus Hippocastanum*, or Horse Chestnut — of the NATURAL FAMILY Hippocastaneæ; SEXUAL SYSTEM, Heptandria Monogynia — which is wild on the mountains of Asia Minor and Persia, and grows in this country, as well as in Europe. The bark has a very astringent taste, is somewhat bitter, and contains a great deal of tannic acid. Canzoneri thinks he discovered a peculiar principle in it, which he calls *Æsculine*, but the existence of this is contested.

EFFECTS ON THE ECONOMY.

The Cortex hippocastani has long been advised as an astringent, but without receiving much attention.† In modern times, it has been proposed by Zannichelli, Hufeland, Voigtel, and others, as the best substitute for the cinchona. These recommendations have caused the bark to be more frequently administered of late, in Europe, by which means it has been discovered to accord almost

* Riecke, Op. cit. S. 256.

† Mérat and De Lens, Art. *Æsculus Hippocastanum*.

entirely in its effects with willow bark: the latter, however, appears to be more effective, and to agree better with the digestive organs. In the wars of Napoleon, when bark was very scarce, it was much employed.

Hufeland and Voigtel recommend it especially in *intermittents*. Sinogowitz* advises, that it should be given after the removal of intermittents by quinia, to prevent a relapse; and, also, in combination with diuretic agents, in the cases of *dropsy* which often succeed to that disease. Krügelstein found it always extremely efficacious in *atonic gout*, and in removing the *weakness of the digestive apparatus* that remains after attacks of gout. The Austrian, Brunswick, Danish, Russian, and Saxon Pharmacopœiast† have an AQUEOUS EXTRACT OF THE BARK, which Voigtel administered with good results in *intermittent fever*, and which he often found serviceable in *chronic discharges from the mucous membranes*. It agrees better with the stomach than the powder or the decoction. Externally, the decoction has been advised as a good astringent.

MODE OF ADMINISTERING.

Pulvis corticis hippocastani compositus.

Compound powder of horse-chestnut bark.

Pulvis Chinæ Factitiæ.

Factitious Powder of Bark.

℞. Hippocast. cort.
 Salic. cort.
 Gentian. rubr. cort.
 Calam.
 Caryophyll. āā. ʒij.

Misce et fiat pulvis.

Hufeland‡ affirms, that this powder is an adequate substitute for cinchona in three cases out of four.

Hufeland, and Prussian Pharmacopœia.

* Rust's Magazin, B. xxix. II. i. p. 84.

† Pharmacopœe Universelle, ii. 14. Paris, 1828.

‡ Armenpharmacopoe. 4te Ausgab. Berl. 1825.

Decoetum corticis hippocastani.

Decoction of horse chestnut bark.

R. Cort. hippocastan. \mathfrak{z} iss.
 Coque cum aquæ f. \mathfrak{z} xviiij. ad reman. colat. f. \mathfrak{z} ix.; cui refrigerat. adde
 Spir. æther. sulph. f. \mathfrak{z} j.—ij.
 Syr. cort. aurant. f. \mathfrak{z} j. M.

To be used during the *apyrexia*.

Voigtel.

Decoetum chinæ factitiæ.

Decoction of factitious bark.

R. Salic. cort. pulv. crass.
 Hippocast. cort. $\mathfrak{a}\mathfrak{a}$. \mathfrak{z} ss.
 Calam.
 Caryophyll. $\mathfrak{a}\mathfrak{a}$. \mathfrak{z} ij.
 Coque cum aq. fontan. \mathfrak{z} xvi. ad reman. colat. \mathfrak{z} viiij.

Prussian Pharmacopœia.

Decoetum hippocastani acidum.

Acid decoction of horse chestnut.

R. Hippocast. cort. pulv. \mathfrak{z} vj.
 Coque cum
 Acid. sulphur. dilut. f. \mathfrak{z} j. et
 Aquæ, f. \mathfrak{z} x
 Ad colat. f. \mathfrak{z} vj.

Used in the after-treatment of *intermittents*.

Sinogowitz.

Electuarium corticis hippocastani.

Electuary of horse chestnut bark.

R. Hippocast. cort. pulv. \mathfrak{z} ss.
 Calam. \mathfrak{z} ss.
 Roob. juniperi, \mathfrak{z} ij. M. ut fiat electuarium.

A teaspoonful to be taken every hour, or every two hours, in
dropsies supervening on intermittent fever.

Sinogowitz.

HYDRAR'GYRI PRÆPARA'TA.

SYNONYMES. Preparations of Mercury.

French. Les Préparations de Mercure.

German. Quecksilberpräparate.

LXXXVI. HYDRAR'GYRI BRO'MIDUM.

SYNONYMES. Hydrargyrum Bromatum, Bromide of Mercury.

German. Bromquecksilber.

Mercury unites with bromine in more than one proportion. A solution of *hydrobromate of potassa* produces with a solution of *nitrate of protoxide of mercury* a white precipitate, which resembles calomel; and appears to be a bromide of quicksilver, answering to the protoxide (*Hydrargyrum Bromatum*, *Hydrargyri Protobromidum*; German, *Quecksilberbromür*). On the other hand, the bromide, which is formed by the direct union of *bromine* with *mercury*, corresponds probably to the peroxide. A white substance results, which can be sublimed by heat, is soluble in water, alcohol, and especially in ether; is coloured red or yellow by the alkalies, and exhibits considerable resemblance to corrosive sublimate (*Hydrargyrum perbromatum*, *H. perbromidum*, *H. deutobromidum*; German, *Quecksilberbromid*).

EFFECTS ON THE ECONOMY.

The effects of these preparations on the sound and diseased organism are not yet well known. They have, however, been employed by some physicians. The **PROTOBROMIDE** strongly resembles calomel in its properties. In the dose of one or two grains, it produces no effect in health, even when taken fasting. In a higher dose — four or five grains, and upwards — it purges moderately, augmenting, at the same time, the secretion of urine. When used in *recent syphilitic affections*, in the way of friction on the gums, or internally in pill, it removes them like calomel; but it does not seem to affect the mouth as speedily or as severely as it.*

The **DEUTOBROMIDE** resembles bichloride of mercury in its action, — producing, in too strong a dose, vomiting and purging,

* Bulletin Général de Thérapeutique, No. 14, Juillet 30, 1837.

with colic and cramp of the stomach; affecting the mouth, and exciting violent salivation.* Werneck, of Austria, has administered it frequently in *syphilis*. In recent cases he prescribes it in the form of pill, beginning with the one-twentieth of a grain. This dose he increases by one-twelfth every two days; the chancres being covered at the same time with compresses, wetted with a solution formed of six grains of the same substance to a pint of distilled water. After a few days' treatment, he remarked, that the sores assumed a better appearance; and from twenty to thirty days were sufficient to effect their entire cicatrization; the total quantity of the bromide administered was about five grains. It was rarely necessary to carry it as high as ten or twelve grains. It has been believed that deutobromide of mercury is less liable to act on the salivary glands than the corrosive chloride, and to affect less severely the stomach and chest.†

Desorgues has recommended the second (?) preparation as a prophylactic and curative agent in *syphilis*. It was doubtless, also — Riecke suggests — the second preparation, which was administered with excellent effects, by Prieger, in *porrigo favosa* of an obstinate character. He terms the preparation *bromus mercurii*, but the true bromate is probably insoluble in ether.‡ the first of the following formulæ is recommended by Prieger.

Guttæ hydrargyri deutobromidi.

Drops of deutobromide of mercury.

R. Bromatis mercurii, (vel potius hydrargyri perbromidi,) gr. vj.

Solve in

Æther. sulphuric. ℥iij. M.

Dose. — Ten to twenty drops, according to the age of the patient, daily, in water.

R. Hydrargyr. deutobromid. gr. j.

Æther. sulphuric. ℥j. M.

Dose. — Ten to twenty drops in barley water, a short time after taking dinner; — in *syphilis*. *Werneck.*

* Dr. Glover, Edinb. Med. and Surg. Journ. Oct. 1842.

† Ibid.

‡ Die neuern Arzneimittel, S. 261. Stuttgart, 1837, & 2te Auflage, S. 371. Stuttgart, 1840.

LXXXVII. HYDRAR'GYRI CYANURE'TUM.

SYNONYMES. Hydrargyri Cyanidum, H. Prussias, H. Bicyanidum, H. Borussias, Hydrargyrum Cyanogenatum, H. Hydrocyanicum, Cyanide or Prussiate or Hydrocyanate or Bicyanide of Mercury.

French. Cyanure ou Hydrocyanate ou Prussiate de Mercure.

German. Cyanquecksilber, Blaustoffquecksilber, Blausaures Quecksilber.

This mercurial preparation is contained in the Pharmacopœias of the United States, Dublin, London, Belgium, Paris, Ferrara, &c.

MODE OF PREPARING.

According to Proust and Gay-Lussac, two parts of good and finely powdered *Prussian blue* must be boiled with one part of *deutoxide of mercury* and eight parts of *water*, until the mixture acquires a bright yellowish tint. It is then filtered, and the filtered liquor, which is the hydrocyanate of deutoxide of mercury — containing, however, some iron—is digested or boiled with an excess of deutoxide of mercury, whereby the oxide of iron is completely precipitated. As, however, the hydrocyanate is combined with an excess of oxide of mercury, this must be saturated with free *hydrocyanic acid*, and the solution be evaporated to induce crystallisation. In this mode the cyanuret is formed.

The formula of the Pharmacopœia of the United States, into which the cyanuret has been introduced to serve in the preparation of the hydrocyanic acid, is the same as that adopted in the *Codex Medicamentarius* of Paris, which was recommended by Berzelius. It is as follows:—

Take of *Red oxide of mercury*, four ounces, or a sufficient quantity; *Ferrocyanuret of iron*, (Prussian blue,) four ounces; *Distilled water*, three pints. Put the oxide of mercury and the ferrocyanuret of iron, previously powdered and thoroughly mixed together, into a glass vessel; and pour upon them two pints of the distilled water. Then boil the mixture, stirring constantly, and if at the end of half an hour the blue colour remains, add small portions of the oxide of mercury, continuing the ebullition until the mixture becomes of a yellowish colour; after which filter through paper. Wash the residue in a pint of the distilled water, and filter as before. Mix the solutions, and evaporate by the fire till the pellicle appears; then set the liquor aside that crystals may form. To purify the crystals, dissolve them again in distilled water; filter; evaporate the solution, and set it aside to

crystallise.* Dr. Christison† does not approve of this preparation. He regards it to be a “needless encumbrance of the London and Dublin Pharmacopœias.” “It was introduced,” he remarks, “into the latter as the source of the hydrocyanic acid; which may now be obtained more cheaply, and equally well, from other materials.”

Schröder directs it to be prepared by mixing a solution of *red oxide* or *deutoxide of mercury* with *hydrocyanic acid*, filtering and evaporating.‡

Cyanuret of mercury forms white, opaque, four-sided prisms, is inodorous, and its taste is extremely disagreeable and metallic. It is decomposed by heat; is readily soluble in water, and becomes converted thereby into hydrocyanate of mercury. It is insoluble in alcohol.

It contains, at times, ferrocyanuret of potassa, proceeding from the Prussian blue, with which it has been prepared.§

EFFECTS ON THE ECONOMY IN HEALTH.

According to Coullon, the poisonous action of this salt is as rapid as that of hydrocyanic acid. A fatal case has been published recently.|| In the dose of from two to five grains, M. Ittner found it produce on dogs only signs of indisposition, tremors, &c.¶ It is one of the substances which Magendie,** in his experiments, found to promote the coagulation of the blood.

EFFECTS ON THE ECONOMY IN DISEASE.

Parent,†† who frequently used this preparation, prefers it greatly to corrosive sublimate, in consequence of its greater solubility, and the capability of more readily affecting the organism by it. According to his experience, *syphilis* yields more readily under its use than under that of any of the mercurials. He did not observe pains in the abdomen accompanying its protracted employment, which he so frequently witnessed when the corrosive chloride

* Pharm. of the United States, p. 118. Philad. 1842; see, also, Mr. Ellis, in Journal of the Philadelphia College of Pharmacy, vi. 24. Philad. 1834-5.

† Dispensatory, p. 519. Edinb. 1842.

‡ See a new process for its preparation, by MM. Chevallier and Deleschamps, in Journ. de Chimie Médicale, Janv. 1830.

§ Orfila, Toxicologie, i. 331.

|| Thibert, cited by Dr. Beck in Amer. Journ. of the Medical Sciences, April, 1842, p. 490.

¶ Mérat and De Lens, Dict. de Mat. Méd. Art. Cyanogène.

** Leçons sur le Sang; and translation in Lond. Lancet, Jan. 20th, 1839, p. 636.

†† Journ. de Chimie Médicale, viii. 473.

was taken. Another advantage which it possesses, is, that it is not so readily decomposed. No salt, no alkali — not even caustic alkali — disturbs it; neither do substances that contain azote or gallic acid, which speedily convert the corrosive chloride into calomel. Moreover, cyanuret of mercury appears to act on the animal textures differently from corrosive chloride. When the latter is placed in contact with flesh, it becomes quickly changed, in part, into calomel; whilst the cyanuret preserves the flesh equally well, without being decomposed. The hydrocyanic acid appears to play no important part in the action of the remedy. According to Olivier's experiments,* the cyanuret, like the corrosive chloride, acts as a powerful excitant to the tissues on which it is applied. He saw a man destroyed by inflammation of the intestines, who had taken twenty-three grains of it.

Cyanuret of mercury was first, perhaps, recommended in Italy, (*Brera*), and Spain. Mendoza especially made many trials with it, from which he was induced to conclude, that it is the best agent we possess in *venereal affections* — an opinion in which he was joined by several of his professional brethren in Malaga. He advises, that laudanum should be added to it, on account of its liability to excite vomiting. When too large doses were administered, or when the patient was unusually impressible, Mendoza found that the nervous system became especially disordered — as indicated by syncope, oppression, anxiety, and convulsions. Chaussier, likewise, as well as Thaer and Horn, proposed the cyanuret as a remedial agent at an early period. On the other hand, Wendt, Cullerier, and Plisson complain of its little efficacy; whence it has been inferred that the preparation must differ.†

Neumann‡ advises it in *chronic inflammation of the lungs, and of the membranous organs of the chest, and abdomen, and of the ovaries*. In particular cases, its use has to be soon pretermitted, in consequence of its powerful action on the salivary glands, even in small doses — as one-eighth of a grain three times a day. In other cases, it can be continued long without the supervention of any unpleasant consequences. In the Charité, at Berlin, it was used with advantage in a case of *obstinate cephalalgia*, the origin of which was *syphilitic*.

Bielt has employed it externally — in the form of the ointment given below — in *humid tetter*, accompanied with inflammation and itching. Parent recommends it to be applied in *chancre*,

* Journ de Chimie Médicale, i. 269.

† Riecke, Die neuern Arzneimittel, u. s. w. S. 264. Stuttgart, 1837, & 2te Auflage, S. 376. Stuttgart, 1840.

‡ Hufeland und Osann's Journal, lv. 66.

and Brera uses it in solution, as a gargle, in *syphilitic ulceration of the fauces*.

Such is the chief testimony recorded in favour of the medical action of the cyanuret of mercury. Dr. Christison* thinks, that "the few trials hitherto made of its effects in diseases scarcely justify its introduction as a remedy." Although, however, it has been but little used in Great Britain, many trials have been made with it on the continent of Europe more especially.

MODE OF ADMINISTERING.

Cyanuret of mercury may be given in pills or in solution; Horn prescribed it in powder, but this form is less appropriate. The dose is from one-sixteenth of a grain to a grain, several times a day. As a *gargle*, half a grain to a grain may be dissolved in ℥j. of water; as an *ointment*, from one and a half to two grains to ℥j. of lard. Chaussier used it in friction on the soles of the feet, in the same way as the corrosive chloride.

Liquor hydrargyri cyanureti.

Solution of cyanuret of mercury.

(*Liqueur Antisyphilitique de Chaussier.*)

R. Hydrargyri cyanur. gr. viij.
Aque destillat. Oj.

Each ounce contains half a grain of the cyanuret.

Chaussier† and Parent.

R. Hydrarg. cyanuret. ℥ss.

Solve in

Aq. destillat. Oj.

Adde

Tincturæ opii, ℥j. M.

Dose. — Morning and evening, a spoonful, in a decoction of sarsaparilla or barley.

Mendoza and Parent.

* Ibid.

† Rattier, Formulaire Pratique des Hôpitaux Civils de Paris, 3ème édit. Paris, 1827.

Pilulæ hydrargyri cyanureti.

Pills of cyanuret of mercury.

- R. Hydrarg. cyanuret. gr. v.
 Opii, ℥ss.
 Micæ panis, ℥j.
 Mellis, q. s. ut fiant pilulæ xcvj.

Dose. — One to four, three times a day.

Parent.

Gargarisma hydrargyri cyanureti.

Gargle of cyanuret of mercury.

- R. Hydrarg. cyanur. ℥ss.
 Decoct. ten. sem. lini, (vel rad. althææ,) Oj.
 M. et fiat gargarisma.

Parent.

- R. Hydrarg. cyanur. ℥ss.
 Decoct. hordei, Oj.
 Mellis rosæ, ℥j. M. et fiat gargarisma.

Brera.

Unguentum hydrargyri cyanureti.

Ointment of cyanuret of mercury.

- R. Hydrarg. cyanur. gr. xij.
 Adipis, ℥j. M. ut fiat unguentum.

Brera.

- R. Hydrarg. cyanur. gr. xvj.
 Adipis, ℥j.
 Ol. limonis, gtt. xv. M.

From half a dram to a dram, to be rubbed in, in cases of *tetter*.
Bielt.

An ointment of this strength is used by Dr. Strohl, of Strasburg, as a dressing for *chancres*.*

* Gaz. Méd. de Strasburg, No. 15. and 17 ; and Encycl. des Sciences Méd. Sept. 1841, p. 525.

LXXXVIII. HYDRARGYRI IO'DIDUM.

SYNONYMES. Hydrargyri Proto-iodidum, H. Proto-ioduretum, Hydrargyrum Iodatum flavum, H. Iodidum, H. Iodidulatum H. Iodatum, (in contradistinction to the Periodatum,) Iodidum Hydrargyrosus, Hydrargyri Proto-iodidum, Protiodide, Proto-iodide or Proto-ioduret of Mercury.

French. Proto-iodure de Mercure.

German. Gelbes Iodquecksilber, Gelbes Quecksilberiodid, Protoiodür des Quecksilbers, Quecksilberiodidul, Iodquecksilber im minimum des Iods.

METHOD OF PREPARING.

According to Tünnermann, the best method of preparing the iodide is the following : — Take of *Nitrate of protoxide of mercury* (not tinged yellow by the admixture of nitrate of peroxide), 28.25 parts, and of *Iodide of potassium*, 16.5 parts; rub them together for some minutes in the dry state, and afterwards with a little *Distilled water*, gradually adding the water so as to dissolve the saltpetre formed. The mixture is then passed through the filter, and the yellowish-green precipitate of iodide of mercury is well washed, and dried by a gentle heat.

The objection to this process is the difficulty of obtaining the mercurial salt at a minimum of oxidation, and the consequent liability of the resulting compound to contain uncertain quantities of the red iodide. M. Boutigny,* to avoid these disadvantages, recommends the following form : — Take of *Mild chloride of mercury*, three ounces and five drams; *Iodide of potassium*, two ounces and four drams: pulverise the iodide in a glass mortar, and add the calomel; place the mixture in a porcelain capsule, and pour over it ten or twelve ounces of *boiling distilled water*. After cooling, decant the fluid, collect the precipitate on a filter, and wash with *distilled water*. Dry in the shade, and keep in a well-stopped bottle.

The iodide, thus prepared, may, according to M. Boutigny, sometimes contain a minute portion of mercury or the mild chloride, but the quantity of either is so small as to be of no moment.

In the London and United States Pharmacopœias, it is prepared by rubbing together an ounce of *mercury* and five drams of *iodine*, adding gradually as much alcohol as may be sufficient until globules are no longer visible. The powder is dried imme-

* *Bullet. Général de Thérapeutique*, and *Amer. Journ. of Pharmacy*, 2d vol. 2d series, p. 326. Philad. 1837.

diately by a gentle heat, access of light being excluded; and it is kept in a well-stopped vessel.*

Iodide of mercury, according to Thomson, consists of 250 parts of mercury, and 156 parts of iodine. It has a greenish-yellow colour, and is a preparation holding the same relation to iodine and mercury, that the mild chloride holds to chlorine and mercury; it is more volatile, however, than the mild chloride, but like it is almost insoluble in water.

EFFECTS ON THE ECONOMY.

This preparation has been less used than the red iodide to be described next. Tünnermann remarks, as the results of his experience, that its action in respect to the mercury, is analogous to that of the mild chloride, except that it appears to excite more the lymphatic and glandular systems. When given in conjunction with a generous animal diet, he found it very efficacious in a case of *scrophulosis*, where *colliquative sweats* had appeared; and in a second case, also, it rendered essential service. In one of the cases, he gave it internally in the dose of from one-twelfth to half a grain, three times a day; in the other, of from half a grain to a grain. He directed it also to be rubbed, in the form of ointment, on *tumefied glands of the neck*. Pelletan likewise found it serviceable in the cure of *obstinate glandular swellings*, when used in the form of ointment in combination with morphia, as well as in cases of *obstruction of the liver*. Biett recommends an ointment of the iodide in the treatment of *chronic venereal ulcers*, the cicatrisation of which it expedites; Lugolt advises it in *phagedenic scrophulous ulcers*, which present a *syphilitic aspect*; and Poirer† recommends it strongly in cases of *psoriasis*; the patient using, at the same time, simple alkaline or vapour baths alternately. According to the experience of Ricord,§ in the *syphilitic affections of children, especially of a cutaneous character*, it is to be preferred to other forms of mercurial, and is not apt to be followed by the bad effects, which, in adults, often supervene on the use of other preparations.||

* Pharm. of the United States, p. 119. Philad. 1842.

† Essays on the Effects of Iodine in Scrophulous Diseases, &c., by Dr. O'Shaughnessy, p. 170. Lond. 1831.

‡ Gazette des Hôpitaux, Juillet 20, 1837; see, also, Bulletin Général de Thérapeutique, Juillet, 1837; and C. A. Porter, M.D., in American Journal of the Med. Sciences, Nov. 1839, p. 68.

§ La Lancette Française, No. 65, 1834.

|| Cogswell's Essay on Iodine, p. 158. Edinb. 1837. See, also, Ricord, Practical Treatise on Venereal Diseases, translated by Drummond, Philad. 1843.

METHOD OF ADMINISTERING.

On account of its insolubility, it is given only in the form of powder or pill, to the extent of from a grain, gradually carried to three or four twice or thrice a day. Externally, it is applied, for the same reasons, in the form of ointment only.

*Pilulæ hydrargyri iodidi.**Pills of the iodide of mercury.*

R. Hydrarg. iodidi, ℥j.
 Confect. rosæ caninæ, ℥iij.
 Zingiberis pulv. ℥j. M.

Pharmac. London.

*Pilulæ hydrargyri iodidi compositæ.**Compound pills of iodide of mercury.*

R. Hydrarg. iodid. gr. vj.
 Extract. opii, gr. iv.
 Lactucarii, gr. xxiv.
 Ext. guaiac. gr. xlvij.

M. Fiant pilulæ xlvij.

Dose. — For a child, half a year old, one pill; for older children, two, three, or four. In the *syphilis of children*.

Ricord.

R. Hydrarg. iodid. gr. j.
 Ext. junip. gr. xij.
 Pulv. glycyrrhiz. q. s.

Divide in pulv. viij.

Dose. — At first, two, morning and evening; afterwards, three or four. *Magendie and Biett.*

R. Hydrargyri iodid. ℥ij.
 Guaiac. pulv. ℥j.
 Thridac. ℥ss. M. et divide in pil. xlvij.

Dose. — One a day in *scrophula*, and *syphilis*, &c.

*Biett.**

* A. Duhamel, Amer. Journ. of Pharm. July, 1841, p. 105.

Pulveres hydrargyri iodidi.*Powders of the iodide of mercury.*

R. Hydrarg. ioidid. gr. i. (iv., vj., vel viij.)
 Magnes. ℥j.

M. et divide in part. xij.

Dose. — A powder, three times a day.

Unguentum hydrargyri iodidi.*Ointment of iodide of mercury.*

R. Hydrarg. ioidid. gr. vj.
 Morphizæ acetat. gr. viij.
 Adipis, ℥j. M.

In *obstinate glandular swellings.*

Pelletan.

R. Hydrarg. ioidid. ℥j.
 Adipis, ℥iss.* M.

In *old venereal ulcers.*

Magendie and Beitt.

R. Hydrarg. ioidid. ℥ij. (vel iij., vel iv.)
 Adipis, ℥ij. M.

As a dressing to *phagedenic* and *scrophulous ulcers.*

Lugol.

When this salve is first prepared, it is of a canary-yellow, sometimes of a greenish colour. By time, it becomes of an orange hue, when it must be thrown aside, as, owing to the formation of the red iodide, it has become as corrosive as the ointment of the corrosive chloride.

R. Hydrarg. ioidid. ℥j.
 Adipis, ℥j. M.

To be rubbed morning and evening on the parts affected.

Poiret.

* Tünnermann uses only ℥ss.

Unguentum hydrargyri iodidi.

Ointment of iodide of mercury.

R. Hydrargyr. iodid. ℥j.

Cerae albæ, ℥ij.

Adipis, ℥vj. M.

Lond. Pharm.

LXXXIX. HYDRARGYRI IODIDUM RUBRUM.

SYNONYMES. Hydrargyri Deuto-iodidum, H. Deuto-Ioduretum, H. Periodidum, Hydrargyrum Iodatum Rubrum, H. Biniodidum, H. Periodatum, Iodidum Hydrargyricum, Red Iodide, Deutiodide, Biniodide or Periodide of Mercury.

French. Deuto-Iodide de Mercure, Periodure de Mercure.

German. Rothes Iodquecksilber, Iodquecksilber im Maximum, Quecksilber-iodid, Deuto-Iodür des Quecksilbers.

METHOD OF PREPARING.

The process of the Pharmacopœia of the United States consists in dissolving an ounce of *corrosive chloride of mercury* in a pint and a half of *distilled water*; and ten drams of *iodide of potassium*, in half a pint of *distilled water*. The solutions are then mixed, and the precipitate is collected on a filter, washed with distilled water, dried with a moderate heat, and kept in a well-stopped bottle.

The following is the process recommended in the London Pharmacopœia: — An ounce of *mercury* and ten drams of *iodine* are to be rubbed together, *alcohol* being gradually added until the globules are no longer visible. The powder is to be dried with a gentle heat, and kept in a well-stopped vessel.

The Edinburgh Pharmacopœia triturates two ounces of *mercury* with two ounces and a half of *iodine*, adding occasionally a little *alcohol* till a uniform red powder is obtained. The product is reduced to fine powder, and dissolved in a concentrated solution — a gallon by measure — of *chloride of sodium*, with the aid of brisk ebullition. It is then filtered, if necessary, through calico, keeping the funnel hot. The crystals, which form on cooling, are then washed and dried.

Red iodide of mercury is a beautiful vermilion-coloured powder, which, when moderately heated, becomes yellow, but, when

exposed to the air, is gradually restored to red, and is volatilised. When volatilised, it crystallises in beautiful rhomboidal leaves, which, at a higher temperature, are of a golden-yellow hue; but at the ordinary temperature of a shining red. The red iodide is insoluble in water; but soluble in alcohol and ether; and in solutions of iodide of potassium, and of chloride of sodium. It contains 250 parts of mercury, and 312 of iodine.

EFFECTS ON THE ECONOMY.

This preparation, which was introduced into practice by the French physicians, has been particularly recommended in *syphilis complicated with scrophula*. Biett found it very efficacious in *scrophulo-venereal ulcers*, in *syphilitic swellings of the lymphatic glands*, and in *inveterate itch*. He administered it also internally, dissolved in alcohol or ether, in *scrophulous affections complicated with syphilis*, and with advantage. In its effects, it resembles the corrosive chloride, whilst the iodide resembles the mild chloride. Rayer,* indeed, considers the red iodide more active than the corrosive chloride. Paillard found it very efficacious in *chronic cutaneous eruptions*. He dipped a camel's hair pencil in a weak solution of the red iodide in ether, and penciled the parts with it three or four times a day. In this way, he cured several squamous, tuberculous, and other eruptions, exciting scarcely any pain. As, however, this mode of applying it often failed, he employed ʒj. mixed with ʒj. of oil of almonds in the same manner. If the corrosive action was considerable, a sense of heat soon arose in the part, which gradually terminated in burning pain. The neighbouring parts were also hot, painful, and tumefied; and, in the course of an hour, an effusion of serum took place; but, in four or five hours, the pain always disappeared. If applied on the cheeks or lips, salivation at times ensued suddenly. Scabs formed, which fell off in a few days, and exposed a red surface much disposed to cicatrise. When frequently applied, symptoms occurred, which were probably the consequences of its being absorbed,—namely, fever, colic, diarrhœa, and dysentery. Breschet† applied it, in the form of ointment, with great success in a case of *obstinate ulceration, presumed to be carcinomatous*, at the angle of the eye. Blasius advises it internally and externally in *lupus*, and it has been recommended highly by Dr. J. W. Schmidt, Junr., of New York,‡ in cases of the same affection,

* Treatise on Skin Diseases, by Dr. Willis, p. 79. See, also, Puche, Journal des Connaissances Médicales, Oct. et Nov. 1833, and Jauvier, 1839.

† Lugol's Essays on Iodine, by O'Shaughnessy, p. 204.

‡ American Journal of the Medical Sciences, Feb. 1840, p. 301.

and especially in the *dartre vénérienne*. Both the iodide and the red iodide were given internally. These cases, as well as *syphilitic sore throat* of long standing, which had been previously treated by mercury without success, Dr. Schmidt found to yield invariably to a pill of a quarter of a grain of the protoiodide, and a grain of *Extractum Conii*, given night and morning, and afterwards three times daily. After using these pills for from four to eight weeks, he substitutes the solution of iodide of potassium, —changing, in the first place, the action of the parts by cauterizing the throat with the solid *argenti nitras*. Dr. Schmidt has not found it necessary to carry the iodide so far as to touch the mouth, but should it accidentally do so, he stops the mercury, and goes on with the iodide of potassium. Tünnermann used it with advantage, in the form of ointment, for the removal of *furuncular inflammation of the glands of the neck*. Riecke,* likewise, employed it, with great success, as a discutient, (gr. xvj. to ʒj. of *lard*.) in a case of *ganglion in the region of the knee*, from which violent pain proceeded along the nerves when it was pressed upon — and in two cases of *goître*. Whenever it has to be applied over an extensive surface, as in the disease last mentioned, it has generally to be discontinued soon, in consequence of the supervention of inflammation of the cutaneous surface.

In the form of a weak ointment — composed of red iodide gr. ij., *cerate* ʒij., *almond oil* ʒj. — it has been used in *opacity of the cornea*.†

Kopp has published some favourable cases of the therapeutic application of the red iodide. The ointment, given below, he found very efficacious in *luxuriant, chronic, scrophulous, and syphilitic sores*, as well as in *condylomata*, and *venereal blotches*. Not less useful did he find it in many other *skin diseases*, and particularly in *herpes*. In one case, in which he administered it in the last affection, he found a coexistent *goître*, which had been there for several years, almost wholly disappear; and he, consequently, afterwards prescribed it frequently for the latter affection. He also used it, with excellent effect, in *ophthalmia tarsi*, and, where there was a disposition to the formation of *hordeolum*, a little of the second ointment, the form for which is given hereafter, was applied at bed-time to the edges of the eyelids. Lastly, he advises friction with the first ointment in *chronic rheumatic pains*, and in cases of *induration of the glands, especially of the liver*. After the friction has been continued for some time, an eruption occasionally appears.

The Author has frequently administered the red iodide in pub-

* Die neuern Arzneimittel, u. s. w. S. 270.

† Gräfe und Walther's Journ. für Chirurg. Bd. xiii., cited by Pereira, Elements of Materia Medica, 2d edit. i. 762. Lond. 1842.

lic and in private practice, in cases where an active modifier of the system of nutrition appeared to be needed, and where a combination of remedies so potent as mercury and iodine suggested itself. In *chronic glandular enlargements, especially of the liver and spleen*, and in habits where the use of mercury was not contraindicated, both the red iodide and the iodide have, in his hands, proved extremely serviceable. Perhaps there are no preparations, which, under the circumstances in question, merit more attention.

MODE OF ADMINISTERING.

Red iodide of mercury is given internally in the form of powder or pill, or dissolved in alcohol or ether, in the dose of one-sixteenth to one-fourth of a grain, gradually increased daily. Externally, it is applied in the form of ointment.

Pilulæ hydrargyri iodidi rubri.

Pills of red iodide of mercury.

R. Hydrarg. ioid. rubr. in syr. commun.
pau.ill. terendo bene distribuend. gr. v.

Micæ panis alb.

Sacch. pulv. ãã. q. s. ut fiant pilulæ lx.

Dose. — Two, morning and evening, drinking afterwards a cupful of oatmeal gruel. The dose to be raised gradually.

Blasius.

Tinctura hydrargyri iodidi rubri.

Tincture of red iodide of mercury.

R. Hydrarg. ioid. rubr. ℥j.

Alcohol, 36° (.837) f.℥iss. M.

Dose. — Ten to twenty drops, in a glass of distilled water.

Magendie and Bielt.

Syrupus hydrargyri iodidi rubri compositus.

Compound syrup of red iodide of mercury.

R. Hydrargyr. ioidid. rubr. gram. i. (gr. 15,44 Troy.)

Potass. ioidid. gram. 50.

Aquæ, gram. 50.

Dissolve, filter through paper, and add

Syrup. (30° when cold), gram. 2400.

A tablespoonful of this syrup is a dose. It represents, provided it holds 25 grammes of the syrup, a centigramme of red iodide of mercury, and 50 centigrammes of iodide of potassium.
*Gibert.**

Æther sulphureus cum hydrargyri iodido rubro.

Sulphuric ether with red iodide of mercury.

R. Hydrarg. iodid. rubr. ℥j.

Æther. sulphur. f.℥iss. M.

Administered like the last.

Magendie and Biett.

Unguentum hydrargyri iodidi rubri.

Ointment of red iodide of mercury.

R. Hydrarg. iodid. rubr. in pulv. subtiliss. gr. vj.

Adipis, ℥vj. M.

Kopp.

R. Hydrargy. iodid. rubr. in pulv. subtilissim. gr. $\frac{1}{2}$ to $\frac{1}{4}$.

Adipis, ℥ij.

Ceræ albæ, gr. ij.

M. fiat unguentum.

For an eye salve.

Kopp.

R. Hydrargyri iodid. rubr. gr. xv.

Adipis, ℥ss.

M. exactissimè. Fiat ung.

As a dressing in *lupus*.

Blasius.

R. Hydrarg. iodid. rubr. gr. xv.

Adipis, ℥ij.

Ol. bergamot. gtt. x. M.

To be rubbed on the parts in *chronic cutaneous affections*.

Biett.

R. Hydrarg. iodid. rubr. ℥j.

Adipis, ℥iss. M.

Biett.

To be spread thin on lint in *old venereal ulcerations*.

The *Unguentum Hydrargyri Biniiodidi*, of the London College, is prepared like the *Ung. Hydrarg. Iodidi* (p. 352).

* Journal de Pharmacie, Oct. 1841, p. 634.

XC. HYDRAR'GYRI ET ARSEN'ICI IO'DIDUM.

SYNONYMES. Arsenici et Hydrargyri Iodidum, Hydriodas Arsenici et Hydrargyri; Iodide or Hydriodate of Mercury and Arsenic, Double Iodide of Arsenic and Mercury, Iodo-arsenite of Mercury.

Mr. Donovan* has proposed this new compound, which he regards as more efficacious than either the Iodide of Mercury or the Iodide of Arsenic.

METHOD OF PREPARING.

Triturate 6.08 grains of finely levigated *arsenious acid*; 15.38 grains of *mercury*, and 50 of *iodine*, with one dram, by measure, of *alcohol*, until the mass has become dry, and, from being deep brown, has become pale red. Pour on eight ounces of *distilled water*; and after trituration for a few moments, transfer the whole to a flask; add half a dram of *hydriodic acid*, prepared by the acidification of two grains of iodine, and boil for a few moments. When the solution is cold, if there be any deficiency of the original eight ounces, make it up exactly to that measure with distilled water. Finally filter.

By the long continued trituration of arsenic, mercury, iodine, and alcohol, the metals are converted into iodides, which combine. The mass, by solution in water, is converted into a hydriodate of arsenic and mercury. The quantities of the two metals are so adjusted, that, when converted into protoxides by decomposition of a portion of the water in which they are dissolved, there will be eight grains of protoxide of arsenic, and sixteen of protoxide of mercury. The quantity of water is such, that each dram by measure of the solution will contain exactly one-eighth of a grain of protoxide of arsenic, and one-fourth of a grain of protoxide of mercury. Mr. Donovan conceives, that the quantity of mercury ought to be double that of the arsenic, in order to insure a slow, and moderate, yet adequate mercurial action, along with the proper effect of the arsenic.

Of the preparation, above described, and which Mr. Donovan calls *Liquor Hydriodatis Arsenici et Hydrargyri*, each dram by measure consists of water, one dram; protoxide of arsenic, one-eighth of a grain; protoxide of mercury, one-fourth of a grain;

* Dublin Journal of Medical Science, Nov. 1839, p. 281. See, also, M. Soubeiran, December, 1841, p. 744; and Mr. Donovan, Dublin Journal, Nov. 1842, p. 171.

iodine, converted into hydriodic acid, four-fifths of a grain. The colour of the solution is yellow, with a pale tinge of green ; its taste is slightly styptic. It is incompatible with tincture of opium, or with sulphate, muriate, or acetate of morphia.

The test of the perfection of the preparation, according to Mr. Donovan,* is, that the whole of the iodine, arsenic and mercury shall disappear, and be dissolved during the process of preparing it. This cannot happen unless the three elements employed have been chemically pure, and unless the trituration has been sufficiently long continued. The colour, a short time after the liquor has been prepared, should be golden-yellow, and the specific gravity, 1.02.

EFFECTS ON THE ECONOMY.

Numerous trials have been recently made with this preparation in *cutaneous diseases*, especially in *psoriasis*, *lepra* and *lupus* ; and the testimony of some of the most eminent of Mr. Donovan's countrymen has been brought forward in its favour. Mr. Carmichael has given it in five or six cases of *lupus*, and in one of *psoriasis*, with decided benefit.† Mr. Colles administered it in two extreme cases of *scrophulous ulceration* in the adult with some benefit : Dr. Croker gave it internally and applied it externally with complete success in a case of *psoriasis guttata* : Dr. Graves treated a very inveterate case of *psoriasis* with decided advantage ; Dr. Irvine completely cured a most virulent case of the same affection by the internal use of it ; Mr. Cusack found, that *venereal eruptions* yielded rapidly to half dram doses, three times a day ; and Sir Henry Marsh had a case of *impetigo figurata*, of strumous origin, covering the face, chest, arms, and thighs, but particularly well marked at the flexures of all the joints, which was cured by the administration of fifteen minims, twice a day, gradually increased to one scruple, and finally to half a dram. The treatment was cautiously pursued, for somewhat less than a month, with a gradual amendment of the disease, which subsequently disappeared entirely.

Since those cases were published, Mr. Donovan has given numerous others from the practice of Dr. Charles O'Reilly, Sir Henry Marsh, Dr. Robert J. Hickson, Dr. J. D. White, Mr. Richard Jones, Dr. Bigger, Mr. O'Ferrall, Dr. Ferguson, Dr. Osbrey, Dr. W. T. Hamilton, Dr. Graves, Dr. Kirby, Mr. Gabriel Stokes, and Dr. C. P. Croker, which lead him to infer, that the diseases, in which the preparation has been found of most ser-

* Ibid. Sept. 1840, p. 106.

† Dublin Medical Press, Jan. 18, 1840.

vice, are the various forms of *psoriasis*, *impetigo*, *porrigo*, *lepra*, *venereal eruptions* — both papular and scaly — *pityriasis*, *sycosis*, *ephelis*, *lupus*, *sibbens*, and some *uterine diseases*.*

In several of the cases, slight ptyalism was induced.

MODE OF ADMINISTERING.

The dose of the *Liquor Hydriodatis Arsenici et Hydrargyri* is from fifteen minims to half a fluidram, two or three times a day. Mr. Donovan recommends the following form:—

Haustus liquoris hydriodatis arsenici et hydrargyri.

Draught of the solution of hydriodate of arsenic and mercury.

R. Liq. Hydriodat. Arsenic. et Hydrarg. ℥ij.

Aquæ destillat. ℥iiss.

Syrup. zingib. ℥ss. M.

Divide in haustus iv.

Dose. — A draught, night and morning.

The division into draughts, Mr. Donovan considers necessary, — *first*, to insure accuracy of the dose; and *next* to prevent injury to the ingredients by the use of a metallic spoon, as a measure; — the general way in which doses of medicines are administered.

When applied externally in cutaneous affections it may be diluted with an equal portion of water, or farther — should a weaker lotion be indicated.

Mr. Donovan states, that the employment of this preparation is rapidly extending, as shown by the fact, that within two years and a half, about *three hundred pints* of it have been sent out of his establishment alone, which — as he properly remarks — is a vast quantity of an article prescribed in minim doses.‡

* Dublin Journal of Medical Science, Nov. 1842, p. 199.

† Ibid. Nov. 1839, p. 282.

‡ Ibid. Nov. 1842, p. 199.

XCI. IN'DIGUM.

SYNONYMES. Indicum, Indicus Color, Pigmentum Indicum, Indigo.
German. Indig.

This well-known colouring material is obtained from several species of the genus *Indigofera* (*I. tinctoria*, *I. anil*, *I. disperma*, *I. argentea*, and *I. hirsuta*), belonging to the NATURAL FAMILY Leguminosæ, and, in the Linnæan System, to Diadelphia Decandria. As we receive it, it is in small, solid, brittle masses, of a deep azure colour, without smell or taste, and assuming a coppery lustre on being rubbed. It is entirely soluble in sulphuric acid, and is wholly consumed on burning coals. According to the analysis of Chevreul, 100 parts of Guatemala indigo of commerce contain only 45 parts of pure indigo, or *indigo-blue* — with which no therapeutical experiments have as yet been made: the greater part of the residue consists of a green matter soluble in spirit of wine (*indigo-green*); and a red resin (*indigo-red*); the rest is extractive matter, gum, and some carbonate of lime, oxide of iron, argillaceous and siliceous earth. With hydrogen, pure indigo forms isatic acid, which has considerable resemblance to the hydrocyanic.

EFFECTS ON THE ECONOMY.

The natives of the countries, where the different kinds of indigo grow, employ it occasionally as a therapeutical agent, especially in *diarrhœa* and *intermittent fever*. It is only within the last few years that attention has been paid to it in Europe. Professor Von Stahly,* of Ofen, appears to have first employed it with success in *various spasmodic diseases*, especially in *epilepsy*. To these cases Leu hossek alludes, in detailing certain trials which he himself had made with it. In 1833, Grossheim† made known a case, in which he found it extremely useful. A lady, twenty-eight years of age, had suffered for eleven years with violent *hysterical convulsive attacks*, for which she had employed almost every remedial agent. The attacks began with a feeling of heaviness over the whole body, with slight convulsive twitchings of the limbs, which extended to the trunk, and were followed by total, or almost total, loss of consciousness: this, after an un-

* Hecker's neue Annalen, B. i. H. 1. Berlin, 1835.

† Medicinische Zeitung, No. 51, 1833.

certain period, terminated in a comatose state, from which she was gradually restored — but in a languid condition — to perfect consciousness. Under the use of indigo for half a year, with pediluvia — which had been previously employed without advantage — she completely recovered.

These results gave occasion to the institution of experiments, touching the remedial properties of indigo, in the Charité at Berlin, the results of which have been given by Roth.* In most of the cases, the indigo excited nausea, and even vomiting, preceded by a metallic taste on the tongue. At times, the vomiting was so violent and prolonged, that it was necessary to discontinue it; but generally on continuing its use, the vomiting ceased in three or four days, and diarrhœa took its place. All the patients did not vomit, and many escaped the diarrhœa. When once diarrhœa occurred, however, it commonly persisted as long as the indigo was used. The evacuations were seldom entirely fluid, but usually semifluid, and of a dark bluish-black colour. While the vomiting and purging continued, more or less uneasiness was experienced in the digestive apparatus. The vomiting and diarrhœa were frequently accompanied by pains in the stomach and bowels, which were commonly slight, but occasionally so violent that the indigo had to be discontinued. In every patient at the Charité, the urine was of a dark violet hue. Stahly affirmed, that the perspiration was coloured blue, but this Roth never observed. He remarked, moreover, that after the use of indigo for several weeks, certain patients were easily thrown into slight convulsions, similar to those caused by the use of nitrate of strychnia, and that they were affected with slight subsultus tendinum. Almost all the patients, indeed, who took indigo, were at first more frequently attacked with spasms than prior to the use of the remedy. In the beginning, the attacks of the disease were, in all cases, stronger, but of less duration, than previous to its employment. These changes continued for one, two, three, and even as long as eight weeks, whether the patients took small or large doses. At the expiration of this time, all the epileptic symptoms were diminished in intensity and duration, until the last attacks were mere premonitions.

The number of *epileptic cases*, treated by indigo, which Roth had an opportunity of observing in the Charité, was twenty-six; of these nine were cured, eleven improved, and six remained.

Dr. Ideler,† who instituted the experiments at the Charité, has also given publicity to the results; and his testimony accords with that of Roth. It is proper to observe, however, that, of the nine cases cured, three experienced relapses in from eight to

* Hecker's neue Annalen, B. i. Heft. 1. Berlin, 1835.

† Medicinische Zeitung, No. vi. and Lancet, June 6, 1835.

twelve months ; but from causes, according to Riecke,* which of themselves might have induced epilepsy.

Dr. Strahl,† of Berlin, likewise experimented with indigo, but his results were by no means favourable. In ten cases of old standing *epilepsy*, it was not of the slightest service, and the same may be said of two cases of *St. Vitus's dance*. In four cases of *hysteria*, it excited violent nephralgia, and in one of the cases only, after the affection of the kidney was removed, was the patient cured. It acted, however, signally on the uterus ; in two cases of *spasmodic affections, complicated with amenorrhœa*, the latter derangement was removed, whilst the spasms still continued, even after the recurrence of the catamenia. In the Charité of Berlin, the purest Guatemala indigo of commerce was used, and it has been a question, whether Strahl did not employ one of feebler powers. It is worthy of remark, that he observed a dark green colour of the urine during its use, whilst in the cases in the Charité a dark violet hue was constantly noticed.

Favourable cases are also detailed by Drs. Mankiewicz, of Nackel,‡ and Hohnhorst, of Frankfort.§

Dr. Noble, of Versailles,|| administered it in three cases, in which the disease had continued for four, twelve, and twenty years respectively. At the time of making known the results, a month had elapsed in the first case, and two months in the second, since an attack had been experienced, and the last case he considered entirely cured. In the first patient, who was eighteen years old, four drams occasioned vertigo, slight depravation of vision, and convulsions similar to those produced by strychnia ; and in both the other cases, diarrhœa was induced, which ceased, however, as soon as the indigo was discontinued or the dose reduced one-half. He gave it in the dose of one dram gradually increased to four drams daily.

The observations of Rech, of Montpellier, were not as favourable to it. In none of the epileptics to whom he gave it was there any thing more than a slight amelioration. In the Hospice d'Hommes Incurables du Faubourg St. Martin, trials were also made with it by Dr. Blanche. Of ten cases, five were either cured or improved. One of these had existed for three years, and the paroxysms recurred every five or six days ; but after the administration of the indigo, he had no return at the expiration of five months ; in a second case, a youth fifteen years old —

* Op. cit. S. 276, and 2te Auflage, S. 389. Stuttgart, 1840.

† Hecker's Neue wissenschaftliche Annalen, 1836 ; and Edinb. Med. and Surg. Journal, 1837.

‡ Medicin. Zeitung. Mai 31, 1837, S. 109.

§ Ibid. S. 110, and Medicin. Zeitung des Vereins für Heilkunde in Preussen, 1837, No. 22.

|| Bulletin Général de Thérapeutique, 1836.

who had been epileptic from birth, and had regularly one or two paroxysms a day, from the 19th of July, when the exhibition of the indigo was begun with, until the middle of August, when the results were published — had only two insignificant attacks. The improvement in the other three cases was not as marked, yet it was unquestionable. The other five children experienced no improvement, yet no inconvenience was sustained, although the indigo was given in doses of four, six, and eight drams in the day. It was administered in water or in a tisane; and in one or two cases it excited vomiting, but after having been discontinued, it was borne subsequently. In all it induced tormina, and acted upon the bowels, but did not interfere with the appetite or any of the other functions.

Dr. Benjamin F. Hardy,* one of the senior resident physicians at the Philadelphia Hospital, published the results of some trials made with indigo, which, so far as they go, confirm its anti-paroxysmal power. Two of the seven cases reported were apparently cured, two ameliorated, and three without any decisive results — the medicine not having been continued perhaps for a sufficient length of time. In these cases, it was commenced in the dose of $\mathfrak{z}\mathfrak{j}$, which was usually doubled daily until the patient took $\mathfrak{z}\mathfrak{i}\mathfrak{j}\frac{1}{4}$ daily, which quantity was persevered in for some weeks. In some of the cases, the fæces, urine, and perspiration were all coloured blue.

In other trials, instituted in the same excellent charity, with the indigo, the results were not as favourable.† It is obvious, indeed, that a wide difference must exist amongst cases of epilepsy, and that where the organic modifications are considerable, as indicated by concomitant mania or idiocy, little can be expected from any remedy; but even in such hopeless cases, the number of paroxysms appears to have diminished under its use. Where the cerebral affection is slight and more functional than organic, indigo, like artemisia and other remedies extolled in epilepsy, may be useful. Its main efficacy, perhaps — as has been said of the *Ferri Subcarbonas* (p. 308) — consists in the new impression which it makes, in adequate doses, upon the nerves of the stomach, and through them upon those of the whole system; but to effect the revulsion to the proper extent, it is necessary, that the dose should be augmented day by day, and the remedy be continued in large doses for a sufficient length of time.

Dr. Pereira‡ states, that he has tried it in a considerable num-

* Dunglison's American Medical Intelligencer, for July 15, 1839, p. 122.

† Dr. William H. McKee, in Dunglison's Amer. Med. Intelligencer, Sept. 16, 1839, p. 177.

‡ Elements of Materia Medica, &c., 2d edit. p. 1620, Lond. 1842; or Amer. edit. by Dr. Carson, Philad. 1843.

ber of epileptic cases at the London Hospital, but without deriving the least benefit from it.

MODE OF ADMINISTERING.

As indigo is extremely light, the powder is too bulky for administration; it is taken with disgust, and is apt to excite vomiting. On this account, the form of electuary was selected in the Charité. It was generally combined with the Pulvis aromaticus, or the Pulvis ipecacuanhæ et opii. As to the dose, Roth advises, that it should be commenced in grains but be elevated to drams,—nay even to one or more ounces in the day. In the Charité, the following formulæ were generally employed:—

Pulvis indigi.

Powder of indigo.

R. Indig. in pulv. subtilissim. ℥ss.
Pulv. aromat. gr. v. M. et fiat pulvis.

A powder to be given four times a day.

Electuarium indigi.

Electuary of indigo.

R. Indig. pulv. aquæ guttis nonnullis subact. ℥ij. — ℥ss.
Pulv. aromat. ℥ss.
Syr. simpl. f. ℥j.

M. et fiat electuarium.

To be used in the course of the day.

Ideler.

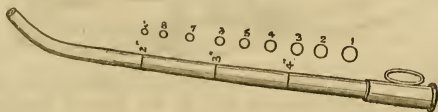
XCII. INJECTIONS OF AIR, VAPOUR OF ETHER, ETC., INTO THE EUSTACHIAN TUBE.

An important improvement in the understanding and treatment of diseases of the ear has resulted from the attention that has been paid, of late, to the pathological condition of the Eustachian tube, and the means through it of rectifying certain morbid states of the organ of hearing. A mystery has been thrown, or

attempted to be thrown, over the diseases of the ear, and as a consequence, they have furnished largely to empiricism ; so that an exclusive aurist has been, too often, perhaps, esteemed synonymous with an exclusive empiric. Now, that the physiology of the outer and middle ear is better understood, their pathological relations are no longer environed with the same difficulties. The attention of the surgeon has to be first directed to the meatus externus, and if he discovers any obstacle, — as hardened cerumen, — which prevents the vibrations of a sonorous body from reaching the membrana tympani, such obstacle must be removed. Should no defect exist there, he inquires into the state of the Eustachian tube, to detect, whether it be pervious so as to permit a free passage for the air from the throat to the middle ear — any impediment to which is a common cause of deafness; and, lastly, if the tube be found in a state of integrity, his attention is turned to the condition of the nerve, to discover whether the defect — organic or functional — be seated there. Such are the main subjects of investigation in cases of *deafness*; although the condition of the membrana tympani, of the ossicles, and the mastoid cells become interesting incidental objects of inquiry.

Chronic inflammation of the Eustachian tube occasionally gives rise to stricture or narrowness of the tube ; at others, to obstruction of the tube by means of mucus, or to accumulation of mucus in the tympanic cavities. In the former case, catheterism is demanded ; in the latter, injections of air, in addition.

For the purpose of catheterism, various instruments have been employed. The catheter of Itard is a conical silver tube, curved at the extremity, with a slight enlargement to prevent laceration of the membrane. Kramer's instrument is a modification of that of Itard ; the curve is more gradual, and the enlarged or button point is omitted. It is made of silver, six inches long, and is of a calibre varying from the size of a small crow-quill to that of a large goose-quill. The extremity is well rounded, and it is curved only to the distance of five lines from the point, exactly at an angle of 144° , so as to correspond to the lateral



(Reduced one-half.)

situation of the mouth of the Eustachian tube. It is of the same calibre throughout its whole length, and provided with a funnel-

shaped dilatation at the outer extremity, half an inch in length, to admit the pipe of the injecting syringe, &c. To this part is attached a ring, on the same level with the beak of the catheter, by means of which the situation of the beak can be ascertained, when the instrument is introduced.

The catheter is farther graduated in inches, which is convenient in repeated introductions.*

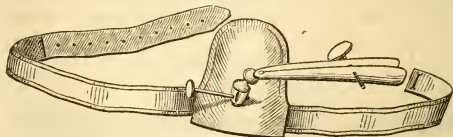
When it is requisite to sound the Eustachian tube, a piece of catgut may be passed through the instrument.

The catheter recommended by Mr. Pilcher† admits of being passed farther into the tube, and has a more gradual curve.

Deleau‡ employs a flexible elastic gum catheter, which the patient learns readily to pass into the Eustachian tube, and by turning down the outer extremity, is able to inflate the tube with his own breath. This the author has seen repeatedly done.

The silver instrument, slightly warmed and oiled, is introduced, with its convexity upwards, along the floor of the nostrils until the point reaches the pharynx; it is then gently turned, so that the point shall be outwards and a little upwards, the aperture of the Eustachian tube being above the level of the floor of the nose: in this way, the tube enters, and is readily felt by the operator to have done so. The instrument is then carried onwards, until its farther progress is prevented by the narrowness of the tube. Mr. Pilcher's instrument is of such dimensions as to frequently occupy three-quarters of an inch of the tube; but if it be pushed beyond the fibro-cartilaginous portion — or that part of the tube which readily admits it — the mucous membrane may be lacerated, and pain will certainly be produced.§

When Mr. Pilcher's catheter is fairly introduced, it will remain without support, an advantage it possesses—in the opinion of its proposer — over those of Itard and Kramer, which require a frontal bandage to retain them in situ. Itard's bandage is re-



presented in the accompanying figure. It consists of a middle piece made of metal, bent so as to fit the arch of the forehead,

* Kramer, on Diseases of the Ear, chap. 2, Amer. Med. Library Edit. Philad. 1838.

† A Treatise on the Structure, Economy and Diseases of the Ear, p. 304. Lond. 1838.

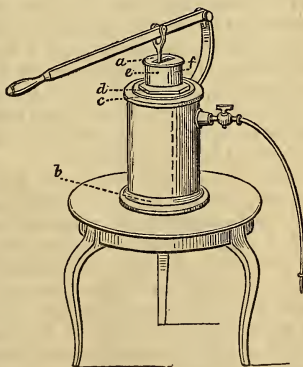
‡ Op. cit. p. 305.

§ Op. cit. p. 305.

and slightly padded within; to this are attached two straps, which fasten with a buckle. To the centre of the middle piece, a pair of forceps are attached, which move in a ball and socket joint, and the blades of which are brought together by a screw. The bandage is applied before the catheterism is commenced; and when the instrument is introduced, the forceps are brought down, and screwed tight on the catheter, so as to retain it in position.

Through the catheter, thus introduced, aurists were in the habit of sending lukewarm water through the Eustachian tube into the cavity of the tympanum;* but owing to certain objections that apply to the employment of fluids, Deleaut suggested the *air-douche* or injections of air for the purpose of clearing the cavity; and this is regarded by Kramer† as a great improvement. With the view of increasing and regulating the force with which the air is sent into the cavity, both these gentlemen invented *air-presses* or condensers. The marginal figure represents that of Kramer.

c b is a cylinder, $10\frac{1}{2}$ inches high, made of molten brass; the diameter of its calibre is $4\frac{1}{2}$ inches, and it is fastened at *b* with strong screws, on a strong oaken stand of the height of an ordinary stool. Within the cylinder *c b* is a pump barrel of wrought brass screwed into it, which measures $10\frac{1}{2}$ inches in height, and $2\frac{1}{2}$ inches in diameter, rising at *d* a 3 inches out of the cylinder, so that the whole machine *a b* is about 13 inches high. In the piston of the pump barrel, there is a valve for the passage of the air, which besides passes in at the opening situate at *d*. There is a second valve in the bottom of the pump barrel, through which the air is forced into the interior of the cylinder.



When air is injected into the tympanum, it may be heard to strike against the membrane, and to rush through the cavity into the mastoid cells, and thus may become a means of exploring the condition of the middle ear.

* See some cases of deafness relieved in this way, by Dr. John H. Dix, in Boston Medical and Surgical Journal, Sept. 25, 1839, p. 105.

† Sur le Catheterisme de la trompe d'Eustache, &c. Paris, 1828; Itard in Mém. de l'Académ. Royale de Médecine, Tom. v. Fasc. 4, Paris, 1836; and translation in Medical and Surgical Monographs, vol. i. p. 75, of Dunglison's Amer. Med. Library, p. 86, Philad. 1838.

‡ Op. citat. p. 164.

Mr. Pilcher* observes, that — from his daily experience of the great facility with which air and fluids may be introduced into the tympanum, and regulated, both as to quantity and force, by means of a common syringe accurately fitted to the catheter — he does not hesitate to declare his conviction, that the ceremony and inconvenience of the air-press may be dispensed with. He recommends that the operator should merely steady the instrument with his left hand, whilst he uses the syringe with his right. By this means, any fluid or gas injected through the catheter, may be brought into contact with the mucous membrane, and thus stimulate the nerves of the cavity. Nor is the air-press entirely devoid of danger. Inflammation and even suppuration is sometimes caused by the air douche. This occurred, in seven cases, to M. Itard; and Mr. Henry Savaget† refers to five cases, which came under his cognizance, where perfect deliquium was caused, which continued for several hours. A case, too, has been detailed in which, after “pumping air” four times through the nostrils into the Eustachian tube, immediately on removing the instrument from the nostril, the patient fell back in the chair and never spoke afterwards.‡ The sudden shock to the nervous system was probably the cause of death; and it has been suggested, that to avoid too great a degree of pressure, the nozzle of the tube of the air-press should be held, during the operation, so loosely in the dilated end of the catheter, that there may be room for air to regurgitate;§ and likewise, that instead of sending in the air by *douches* or charges — it should be transmitted in a gentle and continued stream.

Another circumstance, which shows the importance of care, is the fact, that the mucous membrane may be ruptured, and serious emphysematous tumefaction be occasioned.

It is proper to observe, that the results of 258 cases, treated by Itard,|| are far from encouraging. Of these, but two of cure are said to have been effected, and in this result, according to Itard, other causes occurred; whence he infers, first, that as a means of exploring obstructions of the tympanum by the crepitation, which often accompanies them, *douches* of air can afford no certain index; and secondly, that as a mechanical agent for detaching or evacuating obstructing matters, they can only dislodge and force them together; and, consequently, that both in the second

* Op. cit. p. 307.

† Lond. Med. Gaz., for July 20, 1839, p. 616. Dr. M. Lynch, in *Lancet*, Aug. 3, 1839, p. 683, and *Ibid.* p. 690; and Dr. Joseph Williams, *Treatise on the Ear*; including its Anatomy, Physiology and Pathology, &c. p. 242. Lond. 1840.

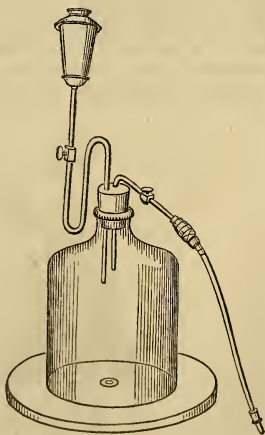
‡ London Med. Gazette, July 6, 1839, p. 538, and *Dunglison's American Medical Intelligencer*, Aug. 15, 1839, p. 150.

§ British and Foreign Medical Review, July, 1839, p. 95.

|| Op. citat.

and first point of view, douches of air do not deserve the confidence of the profession.*

The VAPOUR of ACETOUS ETHER has recently been injected into the middle ear, in cases of *nervous deafness*, of which Kramert† makes two varieties; noise in the ear constituting the essential point of difference between them. This noise belongs, without exception, to the *erethitic* form; whilst it is foreign to the *torpid*. In cases of nervous deafness, Itard proposed to introduce ethereous vapour through the catheter, and to generate this vapour in an apparatus, in which the ether is dropped on a saucer of red hot iron, by the heat of which it is vaporised. The ether is, however, decomposed in this manner, so that it is not ethereous vapour which enters the tympanum, but an acrid very irritating kind of gas, which, according to Kramer, is well suited to the torpid form of nervous deafness, but is positively injurious in the erethitic variety. He considers the attempt to vaporise acetous ether in a flask, placed in warm water, and connected by means of a tube with the cavity of the tympanum, to belong to the same class of methods, which act in too irritating and injurious a manner, owing to the vapour being given off far too rapidly. This inconvenience he proposes to remedy in the erethitic form of nervous deafness, in the following way:—A large glass flask—represented in the accompanying figure—holding about ten quarts, is firmly and closely stopped with a cork through which are passed two brass tubes, each provided with a cock; one of these tubes is connected above with a funnel for dropping in the fluid, and the other with an air-tight tube to conduct the vapour, generated and enclosed within the flask, into the cavity of the tympanum. When the apparatus is to be used, the cork is to be firmly fixed into the neck of the flask, with the two tubes attached, and the cocks closed; the proper quantity of ether is then to be poured into the



* See, on this subject, Mr. T. Wharton Jones, in *Lond. Med. Gaz.*, Aug. 3, 10, 17, and 24: 1839.

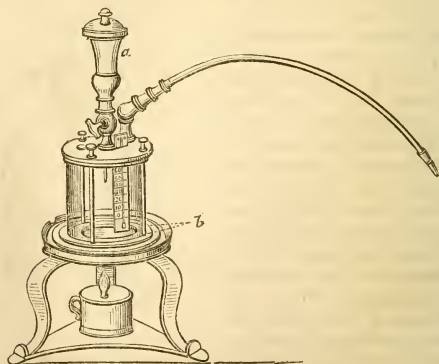
† *Op. citat.* 211.

funnel, and forced into the flask by a gentle expiration, where it is converted into thin vapour at the ordinary temperature of the room. This vapour fills the interior of the flask equably, and is, indeed, in a state of slight condensation, so that when the metallic tip of the tube is connected with the catheter, and the cock is opened, the vapour issues with a whizzing sound.

Having previously introduced the catheter, through the nose, into the mouth of the Eustachian tube, and placed it in connexion with the tube of the vapour apparatus, the patient is to sit near a table, leaning his arm upon it, and with the corresponding hand he is to hold the tube of the apparatus, in such manner that it may remain in close connexion with the catheter. Each sitting occupies a quarter of an hour, and is repeated daily, applying the vapour alternately to the right and to the left ear.

It is unnecessary to make use of warm water to pour into the flask, as the ordinary temperature of the room is sufficient to vaporise the ether.

In the *torpid* form of nervous deafness, this method of procedure does not answer, owing to the necessity for greater excitation than it is capable of effecting. In such case, a modification of the apparatus of Itard has been proposed by Kramer. Owing to the metallic saucer in Itard's becoming cool more than once during a single sitting, and requiring to be exchanged for a hot one, as a necessary consequence the temperature of the vapour generated never remains, for a moment, the same, but varies extremely; immediately after the insertion of the red-hot saucer,



the vapour issues burning hot into the ear, and in a few minutes sinks to a very low temperature. These evils Kramer proposes to rectify in the following manner:—For the floor on which the bell-glass of the apparatus rests a thin metal plate is substituted,

which is warmed, at pleasure, by an oil lamp placed beneath, so that the ethereous fluid falling on it is thus conducted through the catheter into the middle ear. Through the cover of the apparatus, a thermometer, with a metallic scale, passes down almost to the bottom, and indicates the temperature at which the ethereous vapour passes into the ear.

After a sitting or two — if the individual is to be benefited by the plan — in either form of deafness, an improvement ought to be perceptible.

This course of treatment, aided, occasionally, by attention to the state of the system, has, in Kramer's hands, been attended with satisfactory results, and has been adopted with advantage by others with a more or less modified apparatus.*

A case, of the successful application of the acetous ether in erethitic deafness, has been published by Dr. Bolton, of Richmond, Virginia.† The hearing distance was amazingly improved by it, and the success far exceeded the operator's most sanguine expectations.

The vapour proves, however, at times too irritating, or occasions results by no means to be desired. The Author was applied to in one case in consequence of inflammation having supervened in the mucous membrane, which subsequently extended, in the erysipelatous form, over the cutaneous surface. It yielded to appropriate treatment.

XCIII. IO'DINUM.

SYNONYMES. Iodinium, Iodium, Iodum, Iodina, Iodine.

French. Iode.

German. Iod.

Iodine was accidentally discovered, in the year 1812, by Courtois, a manufacturer of saltpetre at Paris, but it was chiefly through the labours of Gay-Lussac and Sir Humphry Davy,‡ that the chemical relations of this elementary body were appreciated. The discoverer first detected it in the mother waters of soda obtained from sea-weed; and as it was found to exist chiefly in several of the sea-weeds, and especially in the sponges, it

* Pilcher, *Op. cit.* p. 318. See some observations on this subject, with two by no means satisfactory cases, by Mr. T. Wharton Jones, in *London Med. Gazette*, for Aug. 31, and Sep. 7, 1839.

† *Dunglison's American Medical Intelligencer*, April 1, 1839, p. 1.

‡ *Annales de Chimie*, lxxxviii. xc. and tom. xci., and *Philos. Transact.* 1814 and 1815.

struck Coindet,* that experiments might be made with it in goître: from these he obtained such striking results that its reputation soon spread abroad, and it was employed in various other diseases,—often with the most marked advantage. By experience, too, the injurious effects which it is by many considered capable of inducing were appreciated, so that it could be administered more satisfactorily than at an earlier period.

By the continued investigations of the chemist, iodine was found to be more largely distributed than was at first imagined. It was discovered in many of the marine mollusca, in sea-water, and in several mineral waters.

METHOD OF PREPARING.

Iodine is obtained from the mother waters of the soda derived from sea-plants, in which it exists—it is believed—in the form of iodide of sodium. The waters are procured by burning different kinds of weeds which grow on the sea-shore, lixiviating the ashes, and concentrating the liquor. To obtain iodine from this liquor, an excess of concentrated sulphuric acid is added to it, and the whole is boiled gently in a glass retort furnished with a receiver. The sulphuric acid lays hold of the basis of the hydriodic salt, and of the hydrogen of the hydriodic acid; whence result sulphate of soda, water, sulphurous acid and iodine; the last passing over into the receiver in violet fumes with a little acid, and there becoming condensed. To purify the iodine, it may be washed with water, containing a little potassa, and be redistilled.†

It is manufactured in large quantity in Scotland, from the kelp of the Hebrides and Orkney Islands.‡ According to Dr. Traill, the greatest quantity is produced by kelp, made from *driftweed*, which is in a great measure composed of *Fucus digitatus*, and *F. Loreus*;—*catweed*, which consists of *F. vesiculosus* and *F. serratus*, yielding much less of it. One hundred tons of Caithness kelp afford, according to the experience of a manufacturer, one thousand pounds of iodine, or about a 224th part.§ It is always prepared on the large scale, and hence is placed in the *Materia Medica* list of the *Pharmacopœia* of the United States.

Iodine is solid at the ordinary temperature, of a foliated ap-

* Bibliothèque Universelle, Juillet, 1820, p. 190.

† For the method employed by Soubeiran, see *Journal de Pharmacie*, Janvier, 1837; and for that by Baruel, see Bussy, *Ibid*.

‡ Christison, *Dispensatory*, p. 552, Edinb. 1842; and the *Author's General Therapeutics and Mat. Med.* ii. 312, Philad. 1843.

§ Christison, *loc. cit*.

pearance, metallic lustre; of a grayish or bluish-black colour similar to that of plumbago, and friable. It is soluble in 7000 parts of water, and the solution has an orange-yellow colour. Its specific gravity is 4.946 at 62° of Fahrenheit. Its smell is similar to that of chlorine, with which it accords in its property of destroying vegetable colours. It possesses, in a high degree, electro-negative properties. It colours the skin yellow, which colour gradually disappears. It fuses at 220° Fahrenheit. The vapour is of a beautiful violet colour, whence its name (*iodine*, 'blue'). It is soluble in ether and in alcohol; forms an acid both with oxygen and hydrogen, and enters into numerous chemical combinations.*

In consequence of its high price, iodine is very liable to adulteration; and it is said, that coal, black lead, oxide of manganese, and charcoal, have been added to it; but neither Dr. Christison† nor Dr. Pereira‡ has met with any of these impurities, which would remain behind when heat was applied, and admit, therefore, of easy detection. Water is the chief adulterant, and its unusual presence may be suspected if the iodine adheres to the sides of the bottle in which it is kept. Dr. Christison states, that until within the eighteen months before he wrote, he had not met with any British iodine, that did not contain between 15 and 20 *per cent.* of water.

EFFECTS ON THE ECONOMY IN HEALTH.

Soon after the discovery of iodine, and the accurate investigations of Gay-Lussac, Magendie§ instituted a series of experiments in order to appreciate its action on the animal organism. It was injected into the veins without any apparent effect. Several dogs were made to swallow it: they vomited, but it exerted no farther influence. He himself swallowed a coffee-spoonful of the tincture, and perceived no other result than a disagreeable taste, which continued for several hours, but gradually disappeared. In larger doses, however, the effects were markedly injurious. Orfila|| likewise instituted several experiments on dogs, from which he concludes:—that iodine, introduced into the stomach in moderate quantity, acts as a gentle stimulant, but may excite vomiting:—that in the dose of a dram, it almost always killed the animal in four or five days, when the œsophagus

* See, on Iodine and its Combinations, Mr. Duhamel, in *Philad. Journal of Pharmacy*, vi. 101. *Philad.* 1823-4.

† *Dispensatory*, p. 553. *Edinb.* 1842.

‡ *Elements of Mat. Med. and Therap.* i. 235. *Lond.* 1842; or *Amer. edit.* by Dr. Carson, i. 225. *Philad.* 1843.

§ *Formulaire pour la préparation, &c. de plusieurs nouveaux Médicaments.*

|| *Toxicologie*, i. 556.

had been tied to prevent vomiting, and that in the part of the mucous membrane, with which it came in contact, ulcers were gradually formed; — that when administered in the dose of from two to three drams, the œsophagus not being tied, it excited vomiting for several hours, even when a part of the poison had been evacuated by the bowels; — that it seldom caused death when given in the dose of one or two drams, the animal rejecting it by repeated vomiting; that it does not destroy life when applied externally, and that it must be classed amongst the irritant poisons. Dr. Cogswell,* — in repeating one of Orfila's experiments, in which seventy-two grains of iodine were introduced into a wound on the back of a dog without much effect on the health of the animal, — did not attain exactly the same results. He introduced a scruple of iodine into the cellular tissue of the thigh of an adult rabbit, through a small opening made in the skin. The animal manifested no symptom of pain, and was able to make use of the limb as freely as before the operation, but, in the course of a fortnight, it gradually lost flesh, exhibiting an emaciated look, and the hair dropped off from many parts of the head. At the end of this time, thick adhesive pus was found distending the cavity of the wound, from which the iodine had entirely disappeared. Dr. Cogswell properly suggests, however, the possibility, that the irritation of a large abscess might have been the sole origin of the animal's unhealthy appearance.

To discover the effects, which it induces on man, Orfila took two grains fasting. An extremely disagreeable taste, with some nausea, was the only consequence. On the next day, early, he took four grains, when he immediately experienced a sense of constriction and heat in the throat, which continued for a quarter of an hour; soon afterwards he vomited a liquid yellowish matter, in which iodine was easily perceptible. Except a slight degree of oppression felt during the day, he observed no change in any of the functions. On the second day thereafter, he took six grains fasting, after which, he soon experienced a sense of heat, constriction of the throat, nausea, eructation, increased flow of saliva, and pain at the pit of the stomach; ten minutes afterwards, he was attacked with copious bilious vomiting, and slight colic pains, which continued for an hour, and were removed by two emollient glysters. The pulse, which, prior to the experiments, beat sixty times in the minute, became more frequent, beating from eighty-three to ninety, and was much stronger. The breathing was tolerably free; but from time to time, there appeared to be a great obstacle to the dilatation of the chest on inspiration. The urine was higher coloured. All the symptoms were removed by the copious use of gum water as drink, and of emollient glysters.

* *Experimental Essay on Iodine and its Compounds.* By C. Cogswell, A.B., M.D. p. 21. Edinb. 1837.

Dr. Gully, however, says, that he has given as much as three drams of the tincture daily, and did not observe any effect. Dr. Kennedy,* of Glasgow, exhibited, within eighty days, nine hundred and fifty-three grains of iodine in the form of tincture, the doses having been so proportioned, that towards the last, the patient — a girl — did not seem to be in any way particularly affected; and Dr. Buchanan† gave half an ounce of iodide of potassium within twelve hours, without any unpleasant result, provided diluents were largely taken at the same time. See POTASSII IODIDUM.

It has been conceived, that where iodine proves mischievous, it is owing to its being in a free state, and that it then operates as a corrosive poison. The tincture of iodine, and the ioduretted iodides, are esteemed objectionable on this account.‡

It does not appear, that the vapours of iodine exert any injurious effect on the workmen concerned in its preparation.§

From experiments, instituted by Jörg|| on himself and on other healthy individuals, it appeared to him, that iodine, first of all, acts as a stimulant on the intestinal canal; soon afterwards, it excites, also, the different glands in the cavity of the mouth and stomach, the pancreas, the liver, and even the urinary and genital organs. An afflux of blood to the respiratory organs likewise ensues, which extends even as far as the Schneiderian membrane. There is no doubt whatever, that the iodine enters into the blood, and, in this way, doubtless produces its modifications on the system of nutrition. Two drams, according to Dr. Buchanan,¶ were given to a young man labouring under gonorrhœa, and, as soon as the medicine made its appearance in the urine, blood was drawn from the arm. On examining it, both the serum and the crassamentum were found deeply impregnated with iodine. The same dose was given to a boy affected with dropsy of the knee-joint. About five hours after the dose had been taken, a very small puncture was made into the joint, and upwards of twelve ounces of synovia were drawn off by a cupping-glass. The synovia contained iodine in abundance. To an old man, who had a very large hydrocele, two drams of iodide of potassium were given over night, and the same quantity the following morning; on tapping him some hours after he had taken the last dose, more than thirty ounces of serum were drawn off, containing a large quantity of iodine.**

* Lond. Med. Repository for 1822.

† Lond. Med. Gazette, July, 1836. See, also, Fuster, in *Bullet. Général Thérap.* Fév. 1837, and Sep. 1837.

‡ Brande's Dictionary of the *Materia Medica*, p. 323. Lond. 1839.

§ A. Chevallier, *Annales d'Hygiène Publiq. &c.* Avril, 1842.

|| *Materialen zu einer künft. Heilmittellehre*, u. s. w. i. 473. 1824.

¶ Op. cit.

** Brande, *Op. citat.* p. 321, Lond. 1839. See, also, M. Cantu, in *Journal de Chimie Médicale*, ii. 291 and 394; and Bennerseheidt, *Ibid.* iv. 383.

Dr. Gairdner* observed the action of iodine on the human body when administered in particular doses, and pointed out the disadvantages attendant upon an improvident use of the article. The most striking inconveniences were induced in the digestive organs: it excited diarrhoea, and, at times, obstinate constipation; gastrodynia and violent vomiting, especially when food was received into the stomach.

The emaciation occasioned by it, is, according to some, a striking phenomenon, and may attain an incredible extent; yet it is proper to remark, that Lugol,† in his frequent employment of iodine in scrofula, never observed this result: he affirms, indeed, that emaciated patients became stronger under its use; that the stout did not grow leaner, and that they who held the medium position, in these respects, acquired strength under its employment,—results which have been confirmed by others,‡ and which would, therefore, seem to show that this, as well as some of the other unpleasant effects ascribed to iodine may have been owing to an incautious use of the article.

In addition to the above phenomena, Dr. Gairdner noticed anxiety, depression of spirits, and other symptoms similar to those of hypochondriasis; obscurity of vision; hardness of hearing; palpitations; and tremors of the limbs, particularly of the hands, which last symptom indicated the full effect of iodine on the constitution. Dr. Gairdner found, however, that the remedy was extremely variable in its effects; and that it might frequently be given in large doses, for a long time, without disadvantage; whilst at other times, the unpleasant symptoms supervened rapidly, indicating that much must depend upon the peculiar impressibility of the individual.

Coindet,§ who, as already remarked, first used iodine as a therapeutical agent, speaks of many of the above-mentioned phenomena as resulting from its administration: these he considers evidences of the saturation of the organism, as the effect on the mouth is an index of the same thing in the case of mercury. It appears, however, to be never necessary, in the administration of iodine, to induce saturation of the organism, in order that the full sanative influence of the remedy shall be elicited. On the contrary, it seems to be advisable to avoid such saturation; and accordingly, whenever there are the slightest indications of it, the dose of iodine should be diminished, or it should be discontinued for a time; after which—according to the results of

* Essay on the Effects of Iodine, &c. Lond. 1824.

† Mémoire sur l'emploi de l'Iode dans les Maladies Scrofuleuses. Paris. 1829; and Observations on the Effects of Iodine, p. 17, Johnson's translation. Lond. 1824.

‡ B. Phillips, Lond. Med. Gazette, Jan. 10, 1840.

§ Bibliothèque Universelle, Mars, Avril, Mai, et Septembre, 1821.

numerous cases — its curative agency, when it is resumed, is exerted afresh, and more decidedly. Several physicians, indeed, advise that frequent intermissions should be made in the use of the agent, in order that its action may be more certain.

According to the observations of Coindet and Formey, iodine, when administered internally, occasions increase of appetite; but no influence is perceptible on the condition of the bowels and urinary organs; or on the perspiratory apparatus. On the other hand, when breathed for a few instants, the vapours of iodine caused twice in M. Chevallier* violent colic, which readily yielded to gum water and laudanum. Raspail, however, under analogous circumstances, experienced no other inconvenience than a disagreeable taste in the back part of the mouth. According to Lugol, the vapour, disengaged from tincture of iodine poured into the water of a bath, is liable to induce a state of "*iodic intoxication*," and even of cerebral congestion. He affirms, that it exerted a powerful diuretic influence on all his patients, the urinary secretion being so much augmented, that many of them, contrary to their usual habit, were compelled to rise from bed several times in the night to discharge their urine. In upwards of a third, it had a cathartic effect, producing six or seven evacuations in the day, and occasionally tormina. In several, ptyalism ensued. Others, and especially females, complained of gastrodynia, which was always removed by the wine of cinchona, of which two or three ounces were taken shortly after the iodine.

Dr. Manson,† who used the tincture of iodine, found it occasionally produce sickness of stomach, and Mr. Delisser affirms, that, in two months, he gave one thousand and nineteen grains of iodine to a female affected with cancer of the mamma, — the doses, at certain periods, amounting to thirty grains in the twenty-four hours. The consequences were anorexia, quick pulse, ulceration of the mouth, and fætor of the breath; of a different kind, however, from that which arises from mercury.

It would appear, that the effects of the remedy vary according to the form in which it is administered, and it is proper to observe, in viewing the different results obtained by Lugol and Coindet, that the latter commonly gave the tincture, whilst the former prescribed the solution in water, with a little chloride of sodium. Lugol observes, that the appetite of his patients was very much increased by it. Eager, who likewise administered the watery solution, rarely observed diarrhœa and emaciation; in general, indeed, the appetite and nutrition improved under it. At times, ulceration took place in the mouth, whereby the breath assumed,

* Journ. Général de Méd. ciii. 336.

† Medical Researches on the Effects of Iodine. Lond. 1825.

a mercurial fætor; and salivation has been observed from it, according to Manson,* Winslow,† Ely,‡ Mackall,§ Sir F. W. Smith,|| and others; but Riecke¶ suggests, that this, perhaps, only occurred in those, who, along with the use of iodine internally, had employed iodide of mercury externally. On the genital organs, Eager found it act as an excitant; it augmented the activity of the uterus, and rendered the catamenia more abundant. It is asserted, too, to have increased the sexual appetite, but this is questionable: during its use, indeed, the testes in men, and the mammæ in women, have been observed to disappear:** but this, as will be seen hereafter, is certainly not a common occurrence.†† It has been imagined to cause sterility. Two cases are detailed by Dr. Robert H. Rivers,‡‡ in which barrenness succeeded its administration. Magendie, on giving it as an emmenagogue to a young lady of unsuspected virtue, brought on abortion.§§ Krimer several times observed, even when the tincture was given in small doses, considerable metrorrhagia, epistaxis, hæmoptysis, obstinate diarrhœa, leucorrhœa, &c., supervene under its use.

Dr. J. B. Biddle||| exhibited five grains of the iodide of potassium, four times a day, to a female patient, aged 35. After thirty-five grains had been taken, he was suddenly called, and found her suffering from intense cephalalgia, considerable nervous disturbance, nausea, and remarkable tumefaction of the whole face.

Jahn¶¶ found, in the bodies of two persons who had long made use of it, wasting of the fat; softness and laxity of all the organs and tissues; diminution and disappearance of the glands, and glandiform bodies, — the mesenteric glands, suprarenal capsules, &c., — and the cellular tissue appeared to exist in smaller quantity. In the case of a female, who died from the excessive use of the tincture, Zinck*** found the bowels inflated with gas; in

* Op. citat. p. 61.

† Lond. Med. Gaz. for 1836, p. 401.

‡ Ibid. p. 480.

§ Medico-Chirurg. Review, Jan. 1836.

|| Dublin Journal of Med. Science, July, 1840, and Jan. 1841.

¶ Die neuern Arzneimittel, u. s. w. S. 282.

** Christison, Treatise on Poisons, p. 180; Cogswell on Iodine, p. 47; Edinb. 1837.

†† Pereira, in Lond Med. Gaz. vol. xvii.; and Dict. de Mat. Méd. par Mèrat and De Lens, Art. Iode.

‡‡ American Journal of the Medical Sciences, Aug. 1831, p. 546.

§§ Formulary, Gully's edit. p. 105.

||| Philad. Med. Examiner, Jan. 29, 1842, p. 65. See, also, Dr. R. Coates, Ibid.; Dr. J. C. L. Carson, New York Med. Gaz. Dec. 1, 1841, p. 333, and the Report of a Conversation on the occasional Injurious Effects of Iodine, at the London University College Med. Society, in Philad. Med. Examiner, Jan. 15, 1842, p. 48.

¶¶ Archiv. für medicin. Erfahrung, i. 342, 1829; and Journal Complément. du Dict. des Sciences Médicales, xxxv. 362.

*** Journ. Complém. du Dict. des Sciences Médicales, xviii. 231.

some parts, highly inflamed; in others, exhibiting an approach to sphacelation, both within and without: the inner membrane of the stomach displayed redness, growing deeper from the cardiac towards the pyloric orifice, where the organ looked as if it had undergone corrosion; the liver was large and reddened; and there was ecchymosis of the spleen. Dr. Christison* is of opinion, that iodine is capable of inflaming the latter organ.

The Author has administered iodine very freely, but he has seldom seen unpleasant symptoms ensue, which he was disposed to refer to it; with the exception of such as so nauseous an article was likely to cause on the stomach;† yet from the testimony of many observers, it can scarcely be doubted that the *iodine disease*, or *iodosis*, *iodinia*, or *iodism*, as it has been termed, may become dangerous to life: generally, it is not really so much so as it appears — and is considered — to be, and the evil consequences may be readily avoided by proper foresight. Cases, however, are related, in which its use seemed to have been followed by fatal results;‡ hence, the necessity of circumspection in the employment of so energetic a therapeutical agent.

Under the idea, that the unpleasant symptoms, which the iodides of potassium and iron “are sometimes said to produce,” are owing to the presence of free iodine in them, Dr. C. J. B. Williams§ recommends, that the patient should eat a piece of bread or biscuit after each dose: “the starch of this, combining with the free iodine, removes its injurious property.”

To avoid evil consequences, Wutzer advises that iodine should be immediately discontinued, whenever a feeling of increased heat in the pharynx and stomach is experienced immediately after it is swallowed; but as this evidence cannot be available in small children, attention should be paid, whether, after the medicine has been taken, the temperature of the skin become more elevated; the pulse quicker, and whether there be any evidence of pain when pressure is made on the epigastric region. He, moreover, advises, that it should not be given internally to children at the breast.

It has been affirmed, that if iodine be combined with small doses of opium, all the disadvantages, immediate and remote, may be avoided; and it is always more advisable to give it in small doses for a longer, than in very large for a shorter, period. At times, it will happen, that in chronic affections — in which it

* Treatise on Poisons.

† See his General Therapeutics and Mat. Med. ii. 314. Philad. 1843.

‡ Sir B. Brodie, Lancet, Mar. 30, 1839.

§ The Library of Medicine, arranged and edited by Alexander Tweedie, M.D., F.R.S. — Practical Medicine, vol. iii. p. 124. Art. Pleurisy, by Dr. Williams. Lond. 1840.

is chiefly used — its beneficial agency may not be decidedly manifested until after the lapse of four or five months; and it is important to bear this in mind, as both practitioner and patient are apt to become dissatisfied, unless the remedy exhibits its action more speedily. When it acts beneficially, the appetite is augmented, or is not deteriorated; digestion improves, so that the patient is able to take more food, and experiences less inconvenience therefrom: the secretion of the bile is increased, and the evacuations are more copious, and of a yellower hue; the peristaltic action goes on more energetically, and the patient gains strength. Such, at least, are the signs that are considered by many to indicate that iodine agrees; but the absence of all disagreeable consequences is a sufficient index.

To remove the symptoms of iodine disease, general or local bloodletting has been employed; with warm bathing; the use of milk; emulsions of gum arabic, and the like; and rigid diet and rest. The preparations of hydrocyanic acid have also been given with advantage in the palpitation, tremors, and other nervous symptoms that sometimes follow the use of the remedy.

Precaution is requisite in the case of impressible, and also — it has been conceived — in robust persons,* to avoid the supervention of hyperæmia. It is advisable, too, during its administration, to let the diet be sparing, and devoid of all heating qualities. Kolley† remarks, that iodine occasionally exerts a most unfavourable influence on the nervous system, so that, in those who are easily excitable, unusual pains may be brought on by the use of even three or four drops of the tincture; these pains, at times, ending in violent spasms. Such persons exhibit the impressibility, even under very minute doses, by fidgetiness or restlessness of the limbs, so that they can scarcely be kept quiet: after a time, numbness and heaviness in all the limbs; heaviness of the head, and a species of inebriation‡ succeed, with violent cephalalgia, spasms, tremors of the limbs, paralysis,§ prostration, spasms, depravation of vision, and disposition to lamentation and distress. Some of these nervous symptoms, the author has occasionally noticed, when the dose of iodine has been rapidly augmented. Where the person is liable to gastric uneasiness, caution is requisite in the use of the remedy, as it not unfrequently occasions dyspepsia and violent gastrodynia. All

* Riecke, *Op. cit.* S. 284.

† *Journal Complémentaire*, xvii. 307.

‡ Giddiness was observed by Dr. Manson (*Researches on the Effects of Iodine*, p. 61, Lond. 1825); Ashwell (*Gay's Hospital Reports*, i. 136); and Lugol (*Essays on the Effects of Iodine in Scrophulous Diseases*, O'Shaughnessy's translation, p. 73, Lond. 1831).

§ Sir B. Brodie, *Lancet*, 1832; Manson, *Op. citat.*; and Sir A. Cooper, *Lancet*, ii. 147.

febrile and purely inflammatory diseases, according to Kolley, forbid its use.

Dr. Andrew Buchanan* affirms, that he has never witnessed any of the unpleasant symptoms that have been ascribed to iodine. He asserts, that he has never seen its use "followed by wasting of the testicles or mammæ, by palpitations, faintness, excessive debility, hurried, anxious breathing, dinginess of the surface, copious clammy sweats, increased menstrual discharge, or an oily appearance of the urine, which are enumerated amongst the symptoms characterising the supposed affection, termed iodism." As regards the wasting of the mammæ and testicles, Dr. Pereira suspects it to be very rare. He has seen iodine administered, he remarks, in some hundreds of cases, and never met with one in which atrophy of either organ occurred. Magendie, also, states, that he has never witnessed these effects, although they are said to be frequent in Switzerland.† The author's own experience accords with that of those gentlemen. He has prescribed, and seen it prescribed, largely, both in public and in private; yet no such results have ever supervened. In the Philadelphia Hospital, great attention was paid to the condition of the testes, in several cases in which it was administered, yet no case of atrophy occurred.‡

Dr. J. Adair Lawrie,§ of Glasgow, has advanced the opinion, that the iodides of potassium and starch exert a poisonous influence on the mucous membranes of the air passages, not as direct irritants, but indirectly through the circulation, in the form of acute inflammation. He admits however, that he has never seen them act as irritants to the gastro-intestinal mucous membranes, nor has he ever known them induce emaciation, atrophy of the mammæ and testes, hectic and the other symptoms described under the term *iodosis*.

EFFECTS ON THE ECONOMY IN DISEASE.

Iodine exhibits itself as a most efficacious remedy in a variety of diseases, in which it is desirable to modify the condition of the function of nutrition. In referring to its use in the following diseases, the remarks apply not only to pure iodine, but to the iodides of the alkalies, especially the iodide, and ioduretted iodide

* Lond. Med. Gaz. July 2, 1836.

† Pereira, Elements of Mat. Med. and Therapeutics, i. 238. Lond. 1842.

‡ Dr. A. M. Vedder, in American Medical Intelligencer, for Sept. 1, 1838. See, also, J. Davies, Practical Remarks on the use of Iodine locally applied in various Surgical Diseases and External Injuries, &c. Lond. 1839. Reprinted in Dunglison's American Med. Library, 1839-40.

§ London Medical Gazette, July 3, 1840, p. 590.

of potassium ; the medical properties of which accord with those of iodine.

Bronchocele. — The very first experiments made with iodine were on *goître*. Coindet recommended it strongly in that affection, and Formey* first introduced it into Germany. Coindet gave, in the first instance, the tincture internally; and he remarked, that about a week after the commencement of its use, the skin over the *goître* generally became less tense, the substance of the tumour felt softer, without the tumefaction having abated; the particular portions of the gland became more distinct, separated from each other, and less and less hard, until gradually a diminution was perceptible. Frequently, the *goître* disappeared completely, in the space of from six to ten weeks, under the continued use of the remedy. At an after period, he employed iodine externally, in which form of administration, the evil consequences, sometimes induced by it, are less to be apprehended; and often its internal and external administration were combined.

The efficacy of iodine in bronchocele, has received the most ample confirmation. Cases have been published by Hufeland, Gräfe, Baup, Helling, Ziegler, Vollmer, Reiss, Paulitsky, Hirsch, Ulrich, Jäger, Barchewitz, Meissner, Vogel, Wutzer, Seiler, Ficinus, Nicustädt, Hoffmann, De Carro, J. Reid, Manson, Elliotson, Lugol, Bardsley,† Copland,‡ and numerous others.§ Mr. Bramley, whilst in Nepal amongst the Himalaya mountains, and under unfavourable circumstances, cured 57 out of 116 cases, and brought 34 more into a fair way towards ultimate recovery.|| The Author has administered it in a great many cases of *soft goître*, and in every one the disease was removed. In two it recurred, but the hypertrophy was again dispersed under the use of the remedy.¶

It has been recommended by some, that its exhibition should be preceded by bleeding; and as the abstraction of blood facilitates absorption, bleeding may be advisable; and more especially where but little, if any, effect seems to be induced by it, after it has been administered for some time. Reid advises, that we should commence with its external administration; and, at a later period, conjoin this with the internal.

* Bemerk. über den Kropf, u. s. w. Berlin, 1820; and Hufeland's Journal, B. li. St. 4, S. 91.

† Hospital Facts and Observations, p. 121. Lond. 1830.

‡ Dict. of Pract. Medicine.

§ Richter's Specielle Therapie. Berlin, 1828, S. 214; Dictionnaire de Matière Médicale, &c. par MM. Méral and De Lens, Art. Iode, and Osann, Art. Iod, in Encyclopäd. Wörterb. der Med. Wissensch. Bd. xix. S. 17. Berlin, 1838.

|| Christison, Dispensatory, p. 556. Edinb. 1842.

¶ See the Author's Practice of Medicine, i. 563. Philad. 1842.

Although cases have been published, in which iodine has not answered the purpose of the prescriber, there can be no question, that it is the most efficacious agent in goître in the lists of the *Materia Medica* ; but when the tumour has acquired a cartilaginous hardness, although it may be diminished under the use of the remedy, it can rarely, or never, be wholly removed. Under such circumstances, however, every other remedy would be found equally fruitless.

It is worthy of recollection, that burnt sponge was long celebrated for its powers over goître, before iodine was discovered, and the same was the fact in regard to certain brine sponges, as that of Salzhausen.*

Glandular affections.— Besides the affections of the thyroid gland, there are others of different glandular bodies, in which iodine exhibits itself efficacious. Jahn used friction with it in *induration of the liver* with advantage. Wutzer gave it in two cases of *induration of the spleen*, but no precise deductions could be made as to individual efficacy, owing to its having been combined with other remedies. Milligant relates three cases of *enlargement of the liver or spleen* in children, in which he gave the tincture with success, after mercurials had been used ineffectually. In several cases of *chronic disease of the liver attended with jaundice*, Dr. Abercrombie† found an ointment composed of ʒss. of *iodine*, and an ounce of *lard*, of great benefit. M. Eusèbe de Salle§ and Jahn employed it with success in *enlargement of the testes* ; Riecke,|| too, found it of essential service in a case of great *induration and enlargement of the testicle*, which in the opinion of several physicians would require an operation. Jahn found it useful in a case of *strumous induration of the sub-maxillary gland*, and in one of *tumefaction of the prostate*, the consequence of mismanaged gonorrhœa. Krimer employed it beneficially in cases of *tumefaction and induration of the mesenteric glands* ; and Cerchari¶ found an ointment, composed of a scruple of iodine and an ounce of unguentum rosatum, very efficacious in the cure of *enlarged tonsils*. He applied it to the tonsils, morning and evening, by means of a small brush ; and he asserts, that under its use the tonsils will in two months be restored to their natural dimensions. Inflammation must be subdued before the ointment is had recourse to. Sir B. Brodie** has

* The Author's General Therapeutics and Mat. Med. p. 315. Philad. 1843.

† Cogswell, Op. cit. p. 83 ; see, also, Dr. Casey, New York Journal of Med. Oct. 1840, p. 324 ; and Christison, Dispensatory, p. 557. Edinb. 1842.

‡ On the Stomach, Edinb. 1828 ; or Amer. Edit. Philad. 1830.

§ Journal Complément, xix. 193, and Journal Universal, xi. 346.

|| Die neuern Arzneimittel, u. s. w. S. 286.

¶ American Journal of Pharm. 2d series, ii. 83. Philad. 1837.

** Lancet, Mar. 30, 1839, p. 38.

used it successfully in similar cases; the enlarged tonsils being touched every day with a camel's hair pencil dipped in the tincture.

Delfiz* details a case of *hypertrophy of the mammæ*, which resulted favourably; and in *hypertrophy of the thymus gland* iodine baths have been advised by Dr. Fingerhuth. In *induration of the female mammæ*, not of a malignant nature, Riecke* found it frequently of essential service; and Dr. Pereira† states, that in the *chronic mammary tumour*, described by Sir Astley Cooper, he has seen it afford great relief, allaying pain, and keeping the disease in check.

Scrophula.—Soon after the introduction of iodine, it was used externally in scrophulous affections; and at an early period was prescribed by Gordon, Sir A. Halliday,§ and others, especially combined with mercury. Their observations were confirmed by Magendie, Baup,|| Sablairoles,¶ Baron, Brera, Manson, and others. Wutzer used it in many cases of scrophula, and found it especially useful in the lymphatic (*pastösen*) form. In irritable cases, he was cautious of employing it as well as in hyperæmic conditions; and he found, that when aggravation of the symptoms occurred, some concealed inflammatory disposition was the cause. Lugol** has contributed to the more extensive employment of iodine in scrophula, and has especially recommended the watery solution internally, and baths externally. The fortunate results of his trials, in the hôpital St. Louis, were corroborated by a committee appointed for the purpose by the Royal Academy of Sciences. It afforded eminent service in the different forms of scrophula; but in *scrophulous caries* it merely induced improvement, never entire cicatrization. Lugol regards iodine as the most efficacious remedy we possess in scrophula. Eager,†† in speaking of Lugol's method of managing scrophula, properly lays great stress on the accompanying regimen — nutritious diet, cleanliness, bathing and exercise in the open air — which he regards as indispensable to a fortunate issue. He prefers the watery solution internally to all other remedies. Lugol and Eager unite, with the internal use of iodine, the external, in the form of ointment, or solution; for example, in fistulæ they employ it as an injection. To excite ulcers to cicatrization, after appropriate pressure and injections have failed, Eager recommends, that the skin, which

* Froriep's Notizen, B. xiii. H. 5, S. 33.

† Op. cit. S. 292.

‡ Elements of Mat. Med. and Therap. 2d. edit. i. 224. Lond. 1842.

§ Lond. Med. Repos. Sept. 1821.

|| Bibliothèque Universelle, Dec. 1821.

¶ Bulletin des Sciences Médicales, Fév. 1824.

** Essay on the Effects of Iodine, &c. p. 48.

†† Dublin Journal of Medical Sciences, July, 1834, p. 344.

has separated, at the margins of the ulcers, from the subjacent parts, should be destroyed by caustic or removed by the knife, but that this should not be practised until the scrophulous tendency has been somewhat got under. As a caustic, he directs *calcis viv.* 3vj., *potass.* 3v., to be made into a paste with alcohol, and to be applied a few lines thick : it destroys the skin in about five minutes. According to the same observer, iodine has exhibited its efficacy in various cases of *periostitis*, *scrophulous swellings of the joints*, and *necrosis*. In *scrophulous ophthalmia*, it was less beneficial. In *scrophulous discharges from the nose and ear*, iodine injections were commonly of service. Baudelocque* likewise extols the preparations of iodine in *scrophula* ; but in *scrophulous affections of the bones*, and especially in *caries*, as well as in *scrophulous diseases of the skin*, it appeared to him to be inefficacious. Dr. Isaac Parrish† found the iodide of potassium serviceable in *certain diseases of the eye*, which had a constitutional origin, or were closely allied to a scrophulous or cachectic condition of the general system. The dose in which he gave it was from two to six grains three times a day in a table-spoonful of the compound syrup of sarsaparilla. The author has found excellent effects from it in such cases, when given in simple syrup. Many cases have been related by Zinck, Maunoir, Manson, Weihe, Benaben, Bayle, and others, in which *white swellings of the joints*, of a scrophulous character, were removed by its use. Wutzer has likewise offered favourable testimony in regard to it in affections of the bones, some of which were of a strumous nature. In several cases, so much disorganisation had occurred, that the loss of the whole limb was to be apprehended, yet the iodine arrested the destructive process, and the limbs were preserved. In various scrophulous affections, the tincture of iodine was given by Dr. Kühne‡ with great success, and without any evil consequences. He made it, however, of half the usual strength, beginning with three drops, and gradually increasing the dose to fifteen. In *tumefaction of the joints*, iodine, administered externally, has afforded essential service. Wutzer was of opinion, that the tincture might frequently be applied externally with greater advantage than the ointment ; the alcohol readily evaporating and leaving the iodine on the skin ; for which reason he recommends, that the tincture should be applied repeatedly by means of a camel's hair pencil.

Tubercles. — The efficacy of iodine in scrophulous affections gave rise to the belief, that it might be serviceable in tubercles.

* Etudes sur la Maladie Scrophuleuse. Paris, 1834 ; and London Lancet, May 25, 1839, p. 350 ; see, also, Cogswell on Iodine, p. 75.

† Philad. Med. Examiner, Ap. 16, 1842, p. 241.

‡ Medicinische Zeitung, No. 34, August 24, 1836. Berlin.

Brera and Calloway administered it frequently in *mesenteric tubercles* with success, and the observations of Krimer, referred to above, correspond with theirs. It has also been given with advantage in cases of *pulmonary tubercles*. It was suggested, in such affections, by Dr. Baron, and a case is related by Mr. Haden of apparent tubercles in which it was markedly useful;* similar examples are detailed by Jahn, Waldeck, and others; and it has been recently recommended in conjunction with decoction of cimicifuga by Dr. C. C. Hildreth,† of Zanesville, Ohio, but the evidence adduced by him is not strong. Berton affirms, that he has found *inhalations of the vapour of iodine* of decided efficacy in *confirmed phthisis*, as well as in certain forms of *catarrh*.

It has likewise been advised in *phthical affections*, in the form of vapour, by Sir James Murray,‡ and by Sir C. Scudamore.§ The addition of a little tincture of conium was found by the latter gentleman to be beneficial in subduing the irritating qualities of the gas. His first formula was the following:—*R. Iodin. gr. viij., Potass. iodid. gr. iij., Alcohol. ℥ss., Aquæ destillat. ℥vss. M.* Of this solution from one dram to six, and from twenty to thirty-five minims of a saturated tincture of conium, were used in each inhalation, which was continued from half an hour to forty minutes. Sir Charles considered it better to add the conium at the time of employing the inhalation. At the temperature of 90°, the volatile properties of iodine are given off very sensibly, but conium requires more heat, and that of 120° is not too much for the iodine. Of late, Sir Charles has published the results of his farther observation with this remedy, of which he has as high an opinion as ever. He has somewhat modified his formula, however.¶ He now recommends the following:—*R. Iodin. pur., Potass. iodid. āā. gr. vj., Aquæ destillat. ℥v. ℥vj., Alcoholis, ℥ij. M.* He prefers to add the conium at the time of mixing the iodine solution with the water, and recommends that it should be a *saturated* tincture, prepared with genuine dried leaves. In the commencement of the treatment, he advises very small proportions of the iodine mixture;—for example, from half a dram to a dram for an inhalation of eight or ten minutes duration, and this to be repeated two or three times a day. Of the tincture, to which Sir Charles

* Formulary—the Author's edition, p. 37. Lond. 1824.

† Amer. Journ. of the Med. Sciences, Oct., 1842, p. 280.

‡ On Temperature, Aliment, &c. 1829.

§ Cases illustrative of the Efficacy of various Medicines administered by Inhalation in Pulmonary Consumption, 2d edit. Lond.; and Lond. Med. Gaz. Feb. 17, 1838, p. 804.

¶ London Medical Gazette, Feb. 7, 1840, p. 750. See, also, Dr. E. J. Cox, Practical Treatise on Medical Inhalation, pp. 51–85. Philad. 1841.

gives the epithet "*soothing*," he directs half a dram, which he usually finds to be sufficient, but it may be increased if the cough be very troublesome. He soon augments the quantity of the iodine mixture, progressively from \mathfrak{zj} . to \mathfrak{ziv} .; and at the same time prolonging the period of inhaling, he divides the iodine dose, putting two-thirds at first, and the rest after the expiration of seven or eight minutes. Although the temperature of 120° is the most favourable for volatilizing the active principles of the iodine and conium, mixed with some watery vapour, Sir Charles considers the approximation will be sufficient, if equal parts of boiling and cold water be used, with which the inhaler should not be quite half filled. Care should be taken, however, to prepare the inhaler for this temperature by first washing it out with tepid water. During the process, the inhaler should be kept immersed in a vessel containing water of a rather higher temperature than 120° .

The feelings of the patient will be a great guide as to the strength of the inhaling mixture in any particular case.

A reviewer in the *British and Foreign Medical Review*,* affirms, that his own experience leaves him no doubt as to the great value of the practice as a palliative in *phthisis*, and as an important remedy in *bronchitis*. It is true, however, he adds, that the relief has often been as great from the simple aqueous as from the medicated inhalation. The author's own experience has not been favourable to it,† and Dr. Pereira‡ says he has repeatedly tried it in *phthisis* as well as in other *chronic pulmonary complaints*, but never with the least benefit. The inhalation may be practised in the method recommended under the head of CHLORINE (page 149).

The inhalation of iodine has been dreaded, because, in some instances, troublesome irritation of the larynx has followed its use; but Dr. Corrigan§ considers, that this injurious effect has resulted from the defective means of inhalation hitherto employed. Used in the manner he has recommended, and which we have described—under the article referred to above—gradual in its evaporation, and ultimately combined with a large portion of aqueous vapour, its use, he says, is positively free from any injurious irritative effects. The vapour he found to diminish most remarkably the profuse and wasting purulent expectoration of *phthisis*. The effects of iodine, thus used, on the digestive function were also very gratifying. In all the cases in which Dr. Corrigan employed it, the appetite and state of the intestinal ca-

* April, 1838, p. 606.

† Practice of Medicine, i. 378, Philad. 1842.

‡ Elements of the Materia Medica, i. 245, Lond. 1842.

§ Dublin Journal of Medical Science, for March, 1839, p. 103; and Lond. Med. Gaz. for April 6, 1839, p. 50.

nal were improved. It acted as a useful tonic to the digestive organs, without any of the irritation, which its internal use, in the ordinary form, at times produces. It likewise greatly alleviated the cough, so that the patient was enabled to obtain hours of sound and refreshing sleep; and he, consequently, considers, that even should its use be of little avail against the destructive scrophulous ulceration, which constitutes phthisis, the palliative good, which is derived from it, renders it a valuable addition to our list of remedies. Dr. Corrigan has had his apparatus at work from eight to twelve hours in the twenty-four; and his mode of managing it is as follows: — at night, when the patient is settling to sleep, the apparatus is suspended from the roof of the bed; and, when once arranged, it continues its work quietly and silently for four or five hours, while the patient, asleep, is all this time inhaling the medicated air. In the morning, for three or four hours before the patient rises, it is again at work; and, if necessary, in the midday, while the patient reclines on the bed, with the curtains drawn round three of the sides. The rate of evaporation, which generally gives a sufficiently strong impregnation to the air, is when the tincture of iodine drops from the cotton wick at the rate of from six to eight drops per minute. At this rate, about six drams of the tincture will be evaporated in an hour, and as every particle of iodine is diffused in watery vapour through the air, there are thus diffused in the minutest state of division through the air, in every hour, about thirty grains. “If we suppose the patient to inhale only one-twentieth of the iodine evaporated he will inhale in each hour, and apply to the diseased surfaces, one grain and a half of iodine in a state of the most minute division or solution.” “This quantity we know” — adds Dr. Corrigan — “is quite sufficient to exert a decided action upon scrophulous ulceration; for we find on reference to Lugol’s valuable work on the employment of iodine in scrophula, that in external scrophulous ulceration, the preparation of iodine, which is found beneficial, is a solution which contains only about three grains of iodine in each pint of fluid.” The duration of the inhalation can, of course, be extended at pleasure.

Fontana affirms, that he has observed decided benefit from iodine in a case of *phthisis mucosa*; when given in the form of syrup, and combined with the external application of the ointment of tartarised antimony. Duverney has communicated some cases, which appeared favourable to the prophylactic agency of iodine in *incipient* or *threatened phthisis*, but he himself considers, that his observations have not been sufficiently numerous to effect the demonstration. The author has frequently administered iodine, in various forms, in pulmonary tubercles, but it must be confessed, not with that decided advantage,

which the well known sorbefacient virtues of the remedy, and the recorded observations of others, might seem to promise.* He has never witnessed, on the other hand, the evil, which Riecke† mentions, that it may, under particular circumstances, occasion the speedy development of phthisis, where tubercles exist in the lungs. Riecke refers to a case by Häser, as corroborative of his opinion. A woman, fifty years old, was affected with *anchylosis spuria*, for which an ointment of iodine was recommended; but it had not been employed more than three weeks, and not more than a dram of iodide of potassium had been rubbed in, when symptoms of tubercular phthisis rapidly supervened, which, in half a year, terminated in death. There does not appear, however, in this case, to have been any thing more than a coincidence.

Mr. Leigh‡ directs the patient to apply a sufficient quantity of iodine ointment on the ribs and under the axillæ, and to cover the head with the bedclothes, in order to breathe the iodine volatilized by the heat of the body. The ointment produces counterirritation on the skin where it is placed, and must be repeated according to circumstances. This method, Mr. Leigh thinks, has arrested the progress of phthisis.

In *chronic engorgements of the larynx*, iodine was used in two cases by Trousseau and Belloq;§ once without success, but the second time with marked advantage; and in *tubercles of the liver* it has been regarded worthy of special consideration.||

Dropsy. — Many trials have been made with iodine in cases of dropsy, owing to its powerful eutrophic agency.¶ Bradfield and Bardsley exhibited it frequently with success in *hydrothorax* and *ascites*; and Kissam, in a case of *dropsy, dependent probably upon induration of the liver*. Dr. Coster** says he has removed many dropsies by giving internally from six to fifteen drops for a dose of a mixture composed of *Iodin*. gr. iii., *Potass. iodid.* gr. vi., *Aquæ*, ʒj.; aided by an ointment composed of fifteen grains of *iodine*, with double the quantity of *iodide of potassium*, to an ounce of *lard*. This is to be placed inside the thighs after removing the cuticle by a blister. The armpits and

* Op. cit.

† Die neuern Arzneimittel, u. s. w. S. 289; see, also, Gunther, in Harless's Neue Jahrb. B. xii. St. 3, S. 161.

‡ Lond. Med. Gazette, May, 1841.

§ Traité Pratique de la Phthisie Laryngée, p. 371, Paris, 1837, and Translation by Dr. Warder, Dunglison's Amer. Med. Library edit. p. 145, Philad. 1839.

|| Riecke, Op. cit. S. 290.

¶ Dr. Wm. Stokes, in Amer. Journal of the Med. Sciences, May, 1834, p. 543, from London Med. and Surg Journal.

** Journal de Pharmacie, 1834.

soles of the feet were also rubbed with the ointment. The same plan is recommended by Dr. Osborne.* Jahn, also, regards iodine as one of the most important agents of modern discovery, and as an extremely valuable antihydrotic.† He first used it in a case of *hydrocele*, in which it was doubtful, whether degeneration of the testicle had not been a precursor. The effect of the ointment of *iodide of potassium* left nothing to be desired; and, accordingly, he afterwards employed it in all cases of *hydrocele of the tunica vaginalis*, which he met with, — even in the new born, — united with mercury or extract of conium; and in every case, which was not of too chronic a character, it exhibited its sanative powers. The only unfavourable effects induced by it were a temporary disappearance of the testicle, in some cases; and a humid cutaneous eruption of the scrotum. He also found the iodine extremely useful in *hydrothorax* and *ascites*; and especially in cases of dropsy, that succeeded to exanthematous diseases, and that it acted more speedily and powerfully when combined with some diuretic. He found, farther, that it was followed by the most beneficial results in the *hydrocephalus of children* — as well *chronic* as *acute* — especially when the latter form had attained its full development, — that is, when the inflammatory stage was over, and the accumulation of fluid was the prominent condition. In these cases, he commonly used iodine in the form of iodide of potassium made into an ointment, and rubbed on the head. Frequently, however, he gave iodine also internally, in combination with calomel and digitalis; but it may be objected to this combination, that iodine with calomel forms corrosive chloride, and iodide and red iodide of mercury, so that, in very small doses, it might affect the stomach too violently.‡

Dr. Röser,§ of Wurtemberg, likewise advocates the use of the iodide of potassium, in large doses, in cases of *acute hydrocephalus*, where the ordinary remedies have failed, paralysis has occurred, and death appears to be impending.

M. Ricord|| employed iodine with success in five cases of *hydrocele*; — the tincture being diluted with distilled water, and applied by means of compresses wetted with it, in which the scrotum was enveloped. He used it of four different strengths — $\mathfrak{z}\text{i}$., $\mathfrak{z}\text{ij}$., $\mathfrak{z}\text{ijj}$., and $\mathfrak{z}\text{vj}$. of the *tincture*, to $\mathfrak{z}\text{ijj}$. of *water*.

* On the Nature and Treatment of Dropsical Diseases, 2d edit., p. 48. Lond. 1837; and Dunglison's Amer. Med. Library edit. Philad. 1838.

† Elliotson, in *Lancet*, 1830–31. See, also, P. Spalding, in *Boston Med. and Surg. Journal*, Dec. 25, 1839, p. 314.

‡ Riecke, *Op. cit.* S. 291.

§ Hufeland's *Journal*, for Apl. 1841, S. 84; also *Lond. and Edinb. Monthly Journ. of Med. Science*. See, also, Dr. Fluder, in *Lond. Med. Gaz.* Sept. 30, 1842, and K. G. Zimmermann, *Zeitschrift für die gesammte Medicin.*, August, 1842, S. 418.

|| *Journal des Connaissances Méd. Chirurg.* Janvier, 1833.

In *hygroma*, or *dropsy of the bursæ mucosæ* of the joints, an ointment of iodide of potassium (3ij., ad *axung.* 3j.) has been successfully used by M. Reynaud.* The limb is kept at rest, and morning and evening, or three times a day, friction is made with this quantity of ointment; after which the knee — the joint commonly affected — is covered with a large flaxseed poultice. From some trials made with iodide of lead, there was reason to believe it more efficacious than iodide of potassium. The treatment was generally successful in about a fortnight.

Typhus. — A recent writer, Dr. Morrison,† states, that there is a condition in typhus fever, which is materially benefited by iodide of potassium. It is marked by a dry, parched, brown or black tongue; by dark sordes on the teeth and gums; by a disposition to dark fetid discharges from the bowels; by a weak and compressible pulse; and by the ordinary signs of depraved secretions, vitiated fluids, and debility. The dose, which Dr. Morrison is in the habit of administering, is three grains every four or five hours, dissolved in water, or mixed with wine, &c.

As to the efficacy of iodine in *nervous diseases*, testimony is somewhat discordant. Manson‡ and Elliotson§ found it useful in *paralysis*, but Dr. Bardsley failed with it. *Chorea* was removed by Gibney,|| Bardsley and Manson; and Franklin,¶ by very large doses, relieved a case of *epilepsy*.

The intimate affinity between iodine and the urinary organs has given occasion to its employment in

Incontinence of Urine. — Of which Corter cured two cases by the tincture.

Cutaneous Diseases. — Cases of *dry, scaly tetter* were treated, commonly, by Tünnermann, with an ointment made of iodide of potassium, applied to the affected parts three or four times a day. For the most part, an increase of the evil was at first a pretty sure harbinger of a radical cure; when this attained a certain degree, a change in the organic actions of the skin succeeded; the remedy was then pretermitted, and the parts were washed a few times with soap, when the eruption faded and gradually disappeared. In *moist tetter*, Tünnermann applies only a very weak salve, with which the parts are touched daily, two or three times; in the intervals, he envelopes them in a dry linen rag. The pain, which is always induced by the application, soon passes away. Magendie, Gimelle, and Jeffray** have

* Cabissol, in *Bulletin Général de Thérapeutique*, Fév. 1838.

† Dublin Med. Press, Oct. 21, 1840.

‡ Op. cit.

§ *Lancet*, 1830-31.

|| *Ibid.* 1827-8, p. 54.

¶ *Lancet*, 1830, and Cogswell, *Op. cit.* p. 24.

** Cogswell, *Op. cit.* p. 80.

likewise applied it successfully in tetter. In *chronic cutaneous diseases* in general, the various preparations of iodine are valuable remedies. They enter, as we have seen, the mass of blood, modify the condition of that fluid, and, in this manner, exert a new impression upon the morbid capillaries. The author has often employed them in these cases with success; and like testimony has been afforded by MM. Biett, Gimelle, Kolley, Locher-Balber, Kennedy,* and others. Brehme succeeded in removing, rapidly and completely, a case of inveterate *porrigofavosa*, and *ophthalmia* thereon dependent, by an ointment of iodine.

Dr. G. Billingslea, of Alabama, asserts,† that, for twelve years he has used the tincture of iodine, with the happiest effect, as a local application in the troublesome cases of *herpes circinatus* or ring-worm, that are so common in the southern part of this country. He adds, that he does not recollect a case in which it had been employed, which was not radically cured.

In *lupus*, the tincture applied locally has proved highly beneficial. Under its use, the process of ulceration has stopped, and cicatrization taken place. It is recommended to be applied not only to the ulcerated portion, but to the parts around.‡

Amenorrhœa. — According to Coindet, iodine is a powerful emmenagogue, and the possession of this property has likewise been ascribed to it by Brera,§ who frequently administered it successfully in amenorrhœa; and Formey, Nieustädt, and Ashwell|| confirm their observations. Sablairoles cured three cases by frictions with iodine ointment on the breast, conjoined with the internal use of iodine. It was necessary, however, to give it in large doses, and for a long time. Locher-Balber¶ and Gölis found iodine of value, at times, in those troublesome cases, which occasionally precede the establishment of menstruation; the latter was, however, often deterred from its use, in such cases, by the evil consequences it produced on the respiratory organs, — such as dry cough, or cough accompanied by bloody sputa.

Degeneration of the Ovaries. — Röchling observed a marked effect from the use of iodine in *induration of the ovary*. Jahn cured, by an ointment of iodine and mercury, an enormous degeneration of the ovaries, which gave rise to two tumours, each of the size of the head; and Messrs. Thetford,** Klaproth,†† Jewel,‡‡

* Lond. Med. Gazette, May 8, 1840, p. 260.

† Dunglison's Amer. Med. Intelligencer, May 1, 1839, p. 34.

‡ Pereira, Elements of Mat. Med. and Therap. i. 246. Lond. 1842.

§ Saggio Clinico sull' Iodio.

|| Guy's Hospital Reports, No. 1, Lond. 1836, and Cogswell, Op. cit. p. 43.

¶ Hecker's Litter. Annal. i. 275; and Cogswell on Iodine, p. 77.

** Transactions of the Dublin College of Physicians, v. 510. Dublin, 1828.

†† Revue Médicale, Mars, 1824.

‡‡ Op. cit.

and Ashwell* were equally successful. Baron employed it beneficially in a case of *dropsy of the ovarium*.

In *hypertrophy of the ventricles of the heart*, Magendie recommended it long ago.

In *scirrhus of the uterus, mammæ, &c.*, it has been advised by Heun, Klaproth, Hennemann, Von dem Busch,† Ullmann, Hill, Benaben, Magendie, Bermont, Hammer, Elwert, Wagner‡ Copland,§ Zimmermann;|| and, from their recorded observations, it would seem, that great efficacy ought to be ascribed to it, both when internally and externally administered. A case is recorded by Dr. Thetford¶ in which the *uterus* was of *bony hardness*, and so large as nearly to fill the pelvis; yet it gave way in six weeks to the use of iodine. Seven cases of *hard tumours of the uterus* are likewise reported by Dr. Ashwell,** which were removed by iodine, with occasional depletion, and regulated diet. It was given internally, and at the same time applied externally in the form of ointment (*Iodin. gr. xv., Potass. iodid. ʒij., Ung. cetacei, ʒiss.*), of which a piece of the size of a nutmeg was introduced into the vagina and rubbed into the cervix uteri for 10 or 12 minutes every night. The average time required for the removal of these tumours was from 8 to 16 weeks. Jahn extols it much in *incipient scirrhus of the stomach*, when combined with the application of leeches; and Riecke asserts, that his father found an ointment of iodine extraordinarily useful in a case of *induration of the pancreas*; and, also, in a case of *scirrhus of the pylorus*. Magendie extols it in *cancer of the tongue*; and Benaben and Trüstedt employed it successfully in *stricture of the urethra*, supervening on badly managed gonorrhœa.

Leucorrhœa. — A Parisian physician made the observation, that during the employment of iodine in goitre, obstinate and protracted leucorrhœa disappeared: this induced him to try the remedy in the latter disease, and he found it very efficacious. Gûden and Broglio, likewise, observed it useful in malignant fluor albus; and Benaben, Richond,†† De Salle, Caswall,‡‡ and Broglio, in *gonorrhœa*. The last two individuals gave it especially in those cases, in which, without any marked inflammation, a deeply rooted gonorrhœa existed, with ulcers in the urethra and prepuce, not apparently of a syphilitic character. In chronic

* Guy's Hospital Reports, vol. i.

† Hufeland's Journal, B. lx. St. 2, S. 81.

‡ Revue Medicale, Juin, 1833.

§ Dictionary of Practical Medicine, Art. Cancer.

|| Journal de Pharmacie, Juin, 1842, p. 598.

¶ Trans. of the King and Queen's College of Physicians of Ireland, vol. v.

** Op. cit.

†† Archives Générales de Médecine, vol. iv.

‡‡ Lond. Med. Gazette for 1834.

fluor albus, it was used by Müller* with marked success. A young female had long suffered under this affection, which had reduced her strength, and did not yield to any of the means that had been employed, when the ointment of iodide of potassium was rubbed — morning and evening — on the inner surface of the thighs. After this plan had been continued for four weeks, the disease entirely ceased. MM. Gimelle and Jewell are also advocates for it.†

In *discharges from the nose*, iodine, in the form of iodide of potassium, has been used with advantage by Dr. Elliotson‡ and by Mr. George Fayer§ — given internally, as well as employed in the form of injection (Æj. ad aquæ ʒiv.).

In *secondary syphilis*, iodine has been recommended by Tyrrel, Saville, De Salle, Schlesier,|| Dietrich,¶ A. Cade,** and numerous others; — especially when the disease is complicated with scrophula, and the effects of mercurials. Wallace†† has likewise communicated some fortunate results from the administration of iodide of potassium in secondary syphilis, and Ebers,‡‡ Ricord,§§ Von Haselberg,||| Cullerier and others have confirmed his observations. More recently, Mr. Bullock¶¶ has reported the particulars of eleven cases of secondary syphilitic diseases, of a formidable character, relieved by iodide of potassium, given internally, in doses of eight grains three times a day, in camphor mixture. The symptoms were: — destruction of the vulva and soft palate; or nodes, with nocturnal pains in the tibia, ulna, frontal and malar bones, and affection of the bones of the nose, or rupia and other tubercular eruptions. The period of cure was from one to two months. Mr. Mayo*** has described it as efficacious in

* Wochenschrift für die gesammte Heilkunde, No. 40, S. 633. Oct. 1836.

† Revue Médicale, vii. 249; and Practical Observations on Leucorrhœa, &c. by Geo. Jewell, p. 80, Lond. 1830. See, also, Solon, in Nouv. Dict. de Méd. et Chirurg. Art. Iode.

‡ Lancet, Feb. 10, 1838, p. 725.

§ Ibid. Feb. 24, p. 786.

|| Casper's Wochenschrift, Feb. 4, 1837, S. 78.

¶ Journ. des Chirurg. und Augenheilkunde, von Gräfe und Walther; cited in Encyclog. des Sciences Méd. Jan. 1841, p. 165.

** Bull. Gén. de Thérap. Mai, 1841 and Encycl. des Sciences Méd. Août, 1841, p. 319.

†† Treatise on the Venereal Disease, Lond. 1833.

‡‡ Medicinische Zeitung, Oct. 5, 1836, S. 201 and 207.

§§ J. J. L. Rattier, La Lancette Française, No. 34, Mars 19, 1839. Gazette des Hôpitaux, Mars, 1839, and Langston Parker's Modern Treatment of Syphilitic Diseases, &c., &c. Duglison's Amer. Méd. Library Edit. p. 77, Philad. 1840.

||| Medicinische Zeitung, No. 48 and 49, Berlin. 1837.

¶¶ Edinb. Med. and Surg. Journal, Jan. 2, 1837. See, also, Cogswell on Iodine, p. 80; and Laycock, Lond. Med. Gazette, Mar. 2, 1839, p. 821.

*** Lond. Med. Gaz. xi. 249. See, also, a Treatise on Syphilis, by Herbert Mayo, F.R.S. Lond. 1840.

certain disorders, which are the *consequences of syphilis*, as emaciation, with ulcers of the skin; ulcerated throat, affections of the bones, &c., occurring in those to whom mercury had been given.

Iodide of potassium has been used with much success by M. Ricord* in deep seated *syphilitic tubercles*. Before the tubercles have become inflamed or softened, whilst they are still indurated, he has constantly succeeded in dispersing them by iodide of potassium with small doses of iodide of mercury. Very commonly, however, he employs iodide of potassium alone; and when the tubercles have become ulcerated, he still relies upon it as his principal remedy.

M. Ricord† considers its results to be most happy in the *tertiary forms of syphilis*, in which he considers it the great remedy. He employs it in gradually increasing doses, commencing with ten grains dissolved in three ounces of distilled water, and given at intervals during the day in any convenient vehicle. When the remedy agrees, which it most commonly does if the stomach be healthy, the dose is increased ten grains every two or three days, till it is carried to a drachm, a drachm and a half, or even more, in the course of the day. In the great number of patients, who have been treated by M. Ricord, the beneficial effects of the iodide were constantly exhibited, but not always with the same degree of rapidity.

Nocturnal pains in the bones, and diseases of the bones and periosteum have likewise been particularly benefited by the iodide:‡ the latter, when localized for a longer or shorter period, have yielded sooner when blisters have been applied over the affected parts.

An iodine suppository appeared to Mr. Keate§ to be beneficial in *enlarged prostate*; and iodide of potassium was administered successfully in the same disease by Dr. Casey.||

In *enlargements of the third lobe of the prostate*, M. R. A. Stafford,¶ has recommended it to be applied, by charging a bougie at its point with iodine, or iodide of potassium, and then dipping it into melted tallow, so that a coating may be formed upon it. The

* Langston Parker, *Modern Treatment of Syphilitic Diseases, &c.* Dunglison's Amer. Med. Libr. Edit. p. 77. Philad. 1840.

† *Traité Pratique des Maladies Vénériennes, &c.* Paris, 1838; also, Acton, *Complete Treatise on Venereal Diseases, &c.* Lond. 1841; M. Lafargue, *Encycl. des Sciences Méd.* Février, 1841, p. 359, and M. Séguin, *Bull. Gén. de Thérap.* Dec. 1841.

‡ See, also, Dr. Wm. B. Casey, in *New York Journal of Medicine and Surgery*, Oct. 1840, p. 320; and J. M. Ferrall, *Lond. Med. Gazette*, April 10, 1840.

§ *Lancet*, for 1832-3, p. 672.

|| *New York Journal of Medicine*, Oct. 1840, p. 324.

¶ *Brit. and For. Med. Rev.* Oct. 1840, p. 529.

bougie having been passed so as to reach the desired spot, its point is allowed to rest upon the diseased part, when the tallow gradually melts, and brings the iodine or iodide of potassium into contact with it, and by drawing the bougie gently backwards and forwards, the necessary friction is produced. He has found it advisable to be very cautious as to the strength of the application, as the prostate will not bear a strong preparation either of iodine or iodide of potassium at first. He has found it necessary to employ belladonna, opium, hyoscyamus, &c., to quiet irritation and pain. When these have subsided, he begins carefully by introducing iodide of potassium in the proportion of one grain to the dram of unguentum cetacei, and increasing it as the patient can bear it. He then goes on with two, three, four, five, and even as far as ten grains or a scruple to the dram, according as the case requires it. After this, he adds iodine to it; half a grain, one, two, three, four, or even more grains in the same manner.

In different forms of *rheumatism*, iodine has been given with success by Dr. Clendenning,* in the Mary-le-bone Hospital, and a series of cases in which it was employed has been published by him. Sir B. Brodie† twice relieved rheumatism by the tincture, although, in one of the cases, only temporarily. Cases of acute rheumatism, treated successfully by iodide of potassium, used internally and externally, have been published by Dr. Mackay,‡ Mr. Wardleworth§ and M. Bouyer;|| and in *chronic rheumatism* its success appears to have been equally decided; given alone in full doses — six grains, for example, three times a day — or associated with sarsaparilla. This combination has been highly extolled by Dr. Graves in sciatica and lumbago;¶ and by Dr. Heygate** in chronic rheumatism, secondary syphilis, &c.

In *gout*, too, it has been prescribed. Jahn found it extremely effective in dispersing *gouty tophi*. Valentin observed, that when iodine was given in a case of *goître, complicated with gout*, the tumefaction of the joints and the depositions gradually disappeared. Adopting the hint, he gave it in several cases of gout, with the effect of always mitigating the disease, and, at times, of completely curing it. Gendrin used iodine not only in chronic gouty swellings with success, but also in acute cases. Ebers likewise confirms the efficacy of iodine in gout.

In *coxalgia*, Buchanan recommends the tincture of iodine to

* Lond. Med. Gazette, May, 1835.

† Lancet, for 1832-3.

‡ Ibid. Mar. 2, 1839, p. 830.

§ Ibid. Mar. 30, 1839.

|| Gazette Med. de Paris, No. 32, 1840; see, also, Mr. Davies, p. 317.

¶ Dublin Journal of Med. Science, Nov. 1840.

** London Lancet, Mar. 6, 1841; see, also, Dr. E. D. Connor, *Dunglison's American Medical Intelligencer*, Dec. 1, 1840, p. 257.

be applied by means of a small brush, as well as in cases of *false joint*, of which he has detailed a successful instance. A similar case has also been given by Treusen.

In *adiposis*, Von Gräfe* prescribed it, and not without advantage. The case was accompanied by great voracity and sense of suffocation. Bleeding and cathartics were premised.

In *stomacace* or a *scorbutic state of the gums*, the use of iodine has been recommended by Friedrich; as well as in *mercurial salivation*, by Kluge, Knod,† Klose,‡ Graves,§ Asmus,|| and others; yet its efficacy appears to be somewhat doubtful in the last affection. Heyfelder found it of no value in three cases.

In a case of *stricture of the œsophagus*, it was given with much benefit by Mr. Cumming, of New York.¶ A bougie had been previously used, but without advantage. An adventitious membrane was brought up in scales soon after commencing the iodine. For two or three weeks, the medicine was laid aside, but it was found necessary to resume it.

In *affections of the mucous membrane of the middle ear*, it has been used by Dr. Manson, and also, by Mr. T. Wharton Jones;*** by the former with advantage; by the latter without any marked effect.

Dr. Manson likewise succeeded in curing chronic *Dacryocystitis* by it.

In cases of *hydrocele*, Velpeaut†† prefers a solution of iodine to wine as an INJECTION. He employs the tincture in the proportion of from one to two drams to an ounce of water. He treated successfully twenty cases by this method. Mr. J. R. Martin,‡‡ of India, appears, however, to have anticipated him in this application of the remedy. Up to the time of the presentation of his paper to the Medical and Physical Society of Calcutta, (January, 1835,) he had used it successfully in upwards of ninety cases. More recently, he has communicated to the Medical and Physical Society of Calcutta the results of his subsequent experience. The number treated since March, 1832, at the Native Hospital,

* Walther und Gräfe's Journal für Chirurgie, B. ix. St. 3, S. 367.

† Gazette des Hôpitaux, July, 1837.

‡ Medicinische Zeitung, No. 34, 1836. See, also, Amer. Journal Med. Sciences, Feb. 1834, p. 533.

§ Dublin Journal Med. Science, Jan. 1834.

|| Casper's Wochenschrift für die gesammte Heilkunde, No. 45, 1838, and Encyclographie des Sciences Médicales, Juillet, 1839.

¶ New York Journal of Medicine and Surgery, No. 2, Oct. 1839, p. 451.

** Lond. Med. Gaz. Aug. 17, 1839, p. 754, and Dunglison's Amer. Med. Intel. Nov. 1, 1839, p. 233.

†† Archives Générales de Médecine, Jan. 1837; La Presse Médicale, Mai, 1837. See, also, Dunglison's Amer. Med. Intelligencer, July 15, 1837, p. 138; and Oct. 16, p. 263,

‡‡ Amer. Journal of the Medical Sciences, Nov. 1837, p. 238.

was seven hundred and seventy-seven : of these, seven hundred and sixty-six had a solution of tincture of iodine injected.

In order to ascertain, whether it was by mere stimulation that the cure by the tincture of iodine was obtained, Mr. Martin treated ten cases with a common urethra-syringeful of undiluted port wine, and one with diluted tinctura lyttæ, in the same proportion as that of iodine, ʒij. to water ʒvj. Of this, two drams were injected and retained; the pain during twenty-four hours was excessive, and the inflammation, although not proportionate to the pain, was much longer in subsiding than when the tincture of iodine solution was used: this was also remarkably apparent in the cases treated with undiluted port wine.

Of the seven hundred and sixty-six cases treated, it does not appear that more than four failed.*

For hydroceles containing from six to thirty ounces of fluid, two drams of the solution of tincture of iodine are sufficient; for those containing from thirty to sixty ounces, three drams; and for those of a larger size, four to five drams. When the hydrocele contains less than three ounces, ʒj. of the injection is sufficient.†

The cure is effected much sooner by iodine; and if any infiltration takes place it is readily absorbed.

Highly favourable results have also been obtained by MM. Oppenheim‡ and Fricke,§ and by Mr. Bransby Cooper,|| and the method has been largely employed in this country with equal advantage.¶ Two successful cases are reported by Dr. Stewart.**

Encouraged by the success, which attended the use of iodine injections in hydrocele, M. Velpeaut† has adopted a similar mode of treatment for various kinds of *serous cysts, enlarged bursæ, &c.*, about the knee, in the axilla, breast, neck, and other parts. He punctures the cyst with a trocar proportioned to its size; emptying it in this manner, and then injects through the canula a mixture of one part of tincture of iodine and two parts of water. In a few seconds this is drawn off. In a day or two, the cyst inflames, though never greatly, and it ultimately shrivels and disappears.

* Quarterly Journal of the Calcutta Med. and Physical Society, for Jan. 1837; cited in Amer. Journal of the Med. Sciences, for Feb. 1839, p. 485.

† Dujat, in Gazette Médicale de Paris, Sept. 1838.

‡ Zeitschrift für die gesammte Medicin. August, 1838, S. 389.

§ Ibid. S. 405.

|| Medico-Chirurg. Rev. Apl. 1841, p. 541.

¶ Dr. A. C. Post, New York Journ. of Medicine, April, 1840, p. 369, and Dr. G. W. Norris, Amer. Journ. of the Med. Sciences, Feb. 1839, p. 299.

** India Journal of Medicine, May, 1836.

†† Bulletin Générale de Thérapeutique, Nov. 1841.

M. Velpeau likewise tried the effect of *iodine injections* into the sac of a *reducible hernia*, and repeated the experiment on two other patients; but the difficulty of reaching the sac with certainty, and the unsatisfactory results obtained in these three cases have been regarded as serious objections to the practice. The plan has been adopted by Prof. Pancoast, who has, likewise, used the tincture of cantharides as the material of the injection.

Iodine is said by Coindet and Formey to have been efficacious in cases of *impotence*; and, lastly, Mr. Key* regards it as one of the most efficacious remedies we possess in checking or controlling the *ulcerative process* — the most active *phagedenic ulcers* often yielding in a surprising manner to its influence, and assuming a healthy, granulating appearance.

Mr. John Davies† has published the results of his experience with the local application of iodine — especially the tincture — in various local diseases. In *erysipelas*, no matter where present or of what description, he found the tincture, “painted,” over the part with a camel’s hair brush, preferable to leeches, lotions, incisions, scarifications, or caustic.‡ Mr. William Reeves§ uses in these cases the compound iodine ointment. In *phlegmon*, where pain and throbbing only exist, one application of the tincture of the full strength cut short the disease; and where suppuration had commenced, its repeated use not only checked its progress, but caused the deposited matter to be absorbed. Not a single case of failure occurred, where the tincture was applied in superficial phlegmon before suppuration took place, and even then the pus was much less in quantity than where poultices were used. In *extensive sloughing of the cellular membrane*, after phlegmonous erysipelas of the lower extremities, the tincture proved to be a most valuable application. Whilst the usual remedies had no effect in checking the inflammatory process, the iodine arrested it at once, and gave the living parts a chance of casting off the dead slough.

In *acute inflammation of the joints* it was more efficacious than any of the ordinary local applications. Over the knee — if the skin be delicate — it may be applied at first about half its strength, and be increased gradually as required. When the hip is affected, the strong tincture must be painted all around the upper part of the thigh and groin. In these cases, Mr. Davies prefers leeching the joint, and then using the iodine as the bleeding ceases. Mr. William Reeves|| employs the compound iodine

* Medico-Chirurgical Transactions, xix.

† Practical Remarks on the use of Iodine locally applied, &c., &c. Lond. 1839, and Dunglison’s American Med. Library, 1839–40.

‡ See, also, Dr. Burns, in Philad. Med. Examiner, Nov. 6, 1841.

§ Lond. Lancet, Oct. 22, 1842, p. 119.

|| Op. cit.

ointment, in these cases. In *mastitis* or *inflammation of the mamma*, the tincture of full strength must be laid extensively over the part, as soon as the disease is discovered; and if an abscess should form, its extent will be limited. In *gout*, its application cuts short the attack; and in *anomalous pains of the joints*, supposed to be gouty or rheumatic, its effect has been marked. In these cases, Mr. Davies dilutes the tincture to about two-thirds its full strength. In *chronic inflammation and enlargement of the joints*, such as of the hip and knee, leeches are first employed, and then the diluted tincture is laid extensively over the part, and the application is repeated every two or three days according to its effects on the skin. In the ankle or wrist, where the enlargement is of old standing, an iodine lotion — composed of 32 grains of *iodide of potassium*, dissolved in a fluid ounce of *distilled water*, to which eight grains of *iodine* are added — is preferred to the tincture by Mr. Davies; — a rag being wetted in it three or four times a day, and laid round the joint, and the strength of the lotion being determined by the discretion of the attendant.

In *inflammation of the absorbents*, the strong tincture, applied along the track of the vessels, is generally sufficient to subdue the affection. Employed in *anthrax*, before or after incisions, it dispels the inflammation, and enables the parts to cast off the dead cellular tissue, and form granulations. It is equally applicable to *boils* and *buboes*; — cutting short the progress of the latter; or, if used after suppuration, limiting the extent of the abscess. In *lupus* or *noli me tangere*, the strong tincture laid upon the ulcerated surface has cured the disease without the use of internal remedies. In *malignant ulcers of the tongue and tonsils*, the tincture, of full strength, brushed all over the parts, arrested the affection no matter how threatening. The only internal remedy was the ioduretted solution, — in doses of ten drops twice a day, in water. In *scrophulous swelling of the glands*, it either resolved the inflammation and caused absorption of the morbid deposits, or limited the formation of matter and assisted in the cicatrization of the sore. In *whitlow*, the strong tincture must be immediately painted over the whole finger or thumb, and the application must be repeated in twelve hours, unless the morbid sensation has ceased. Where this has been done prior to suppuration, it never fails, according to Mr. Davies, to subdue the disease. Should matter have been formed, a free incision must be made, and the tincture be applied over the finger or hand if swollen.

In *chilblains*, the tincture, of full strength, is to be applied over the part affected, and beyond the boundary of the surrounding inflammation. This must be repeated daily for some time, and the affected parts should be immersed every night in water,

as hot as can be borne. When the ulceration looks healthy, and the skin around has lost its livid colour, the strength of the tincture may be reduced. After each application, the sore, if any, should be dressed with some stimulating ointment. In cases where the inflammation spreads along the foot or leg, the affected parts must be painted with the strong tincture.

Mr. James Henderson* has likewise found a compound preparation of iodine useful in chilblains. The form is given hereafter. He has generally found three applications sufficient.

In *lacerated, contused, and punctured wounds*, the tincture was found by Mr. Davies to be preferable to every plan of local treatment. When the accident was one of simple laceration — after the blood or dirt had been wiped away, every point of the surface of the wound was touched over with the tincture, generally of the full strength, and the application was extended a little distance beyond. After allowing it to dry, the edges of the wound were brought together with adhesive plaster, which was not renewed for three or four days. At the end of this time, part of the wound was found to be united, and the rest granulating. The granulations with the surrounding skin were washed over, and then dressed with common wax ointment. The cure was generally rapid. Where *contusion* only exists, the tincture is applied by Mr. Davies every day or two to the surface; this quickly occasions the absorption of the extravasated blood. Where there is a combination of laceration and contusion, the treatment is compound. The surface of the wound and contusion is brushed over, and the edges of the former are approximated, and kept together by a plaster or a roller. In *punctured wounds*, from whatever cause, the tincture, liberally applied, is used with the same success it exerts in local diseases, and injuries attended with inflammation. In such cases, it should be allowed to insinuate itself freely into the wound, and be thickly painted upon the surrounding skin.

In *burns and scalds*, it appears to act as in erysipelas. When the integuments are not destroyed, although the cuticle may be in blisters, one or two applications of the tincture, of moderate strength, subdue the pain and redness, after which the parts only require to be kept free from injury. Lastly: — the remedy is said by Mr. Davies to be eminently successful in *ulcers*. Several cases of *chancre* yielded sooner than to the ordinary treatment, and in *malignant ulcerations* about the lips, tongue or tonsils, no topical remedy would seem to be equal to it. In all cases of *irritable or sloughing sores*, the tincture, of full strength, must be applied to the surface and surrounding skin. After being allowed to remain some time, the ulcer must be covered with simple

* Lond. Lancet, Apl. 18, 1840.

ointment in preference to a poultice. The application must be repeated daily till the sore becomes clean and healthy, when the granulations may be touched with the diluted tincture every two or three days. Under this plan, the cavity of the ulcer fills up rapidly.

Mr. Fergusson* has published a most obstinate case of *old ulcers*, which were cured by the use of the corrosive chloride of mercury internally, and the tincture of iodine externally; and M. Ricord† considers the tincture to be the very best topical application in *phagedenic chancre*.

Besides these affections, the tincture has been employed with good effect in *gouty* and *rhematic swellings* of the small joints from thickening of their ligaments, *fistulous openings*, *malignant warts* or *adventitious excrescences*, *ganglions*, *the stinging of wasps*, *diseases of the spine*, *ununited fractures*, *orchitis*, *inflamed urethra* and *chordee*, *inflammation of the bursæ*, *chronic ophthalmia*, and *opacities of the cornea*‡ (being much diluted), *dissection wounds*, &c.

The strength of the remedy, in the several cases, must depend upon the judgment of the practitioner.§

With regard to the relative value of the preparations of iodine, Dr. A. Buchanan|| is inclined to place them in the following order: — Iodide of starch, hydriodic acid, (iodine,) and iodide of potassium; although he admits, that the superiority he ascribes to the first is perhaps owing to his having prescribed it most frequently. The operation of all of these is, however, similar. The only mode, he thinks, of explaining the similarity of action on the body of substances so dissimilar in nature, is by considering the hydriodic acid as the active principle, — free iodine being immediately converted in the stomach into hydriodic acid.

Mr. B. Phillips¶ prefers the iodide of iron in all cases.

M. Mojsisovits, of Vienna,** considers iodide of potassium and the iodides of mercury to be decidedly the most valuable preparations, when pure: but they are often, he affirms, given in prescriptions with matters that decompose them.

In the Glasgow Infirmary, they are in the habit of preparing a LIQUID HYDRIODIC ACID; by dissolving three hundred and thirty grains of *iodide of potassium* in f. 3iiss. of *distilled water*; and two

* London Lancet, Nov. 13, 1841.

† Bulletin Général. de Thérapeutique, 15 et 18 Février, 1841.

‡ See, also, Dr. Lohsse, Medicinisch. Zeitung, Mar. 3, 1841; and Brit. & Foreign Med. Rev. July 1841, p. 258; also, Dr. W. S. Helmuth, Philad. Med. Examiner, Sept. 11, 1841, p. 583.

§ British and Foreign Med. Review, Oct. 1839, p. 523. See, also, Dr. Langon, Lond. Lancet, June 27, 1840, p. 484.

|| Med. Gazette, July 2, 1836.

¶ Lond. Med. Gazette, Jan. 10, 1840.

** Oesterreich, Med. Jahrbuch, cited in Encyclog. des Sciences Méd. Avril, 1841, p. 8.

hundred and sixty-four grains of *tartaric acid* in a like quantity: the solutions are then mixed, and when the bitartrate of potassa has subsided, the fluid is filtered. Water enough is then added to make ℥vj. and ℥ij. Each dram of this liquid acid contains five grains of iodine. The acid, thus prepared, is, however, very liable to change, and is necessarily variable in its effects.*

Lastly; from his researches on the effects of the various preparations of iodine, Dr. Cogswell† infers, 1. That iodine and iodide of potassium act very much in the same way, but that there is still a difference, not merely in point of power, but of specific properties. 2. That, whatever be the proper action of the iodide of sulphur, its facility of decomposition gives it a resemblance to iodine. 3. That the iodides of carbon, so far as examined, have an action peculiar to themselves: and, 4. That in those metallic iodides which were submitted to examination, the preponderance of power is on the side of the bases.

METHOD OF ADMINISTERING.

Iodine is not easily given internally in substance — in the form of pill or powder; neither are these forms to be recommended. Coindet preferred it in the form of tincture; and this is one of the most common modes in which it is administered. When, however, the tincture is taken with water, a great part of the iodine is thrown down, and, it has been conceived, it may thus exert a noxious influence on the stomach; but in the small doses in which it is taken, such an effect can scarcely be anticipated. It would seem, however, that, in the generality of cases, when iodine has disagreed, it has been in the form of tincture. For this reason, it has been given more, of late years, in watery solution; and, to promote the solution, the iodide of potassium (q.v.) is added; or a little salt, according to Lugol's prescription. An ethereal solution is also prescribed. Externally, it is applied in the form of tincture, ointment, or watery solution, or in baths, or fumigations. Frictions with iodine readily occasion considerable irritation of the skin, which commonly soon passes away, when the friction is suspended for a time. After bathing a part, painful rubefaction of the skin often ensues, which is usually followed by perspiration and sleep. Iodine is given internally, in the dose of one-eighth of a grain to a grain, twice or thrice a day.

* Guibourt, in *Revue Médicale*, Août, 1837; and *Bulletin Général. de Thérapeutique*, Sept. 1837.

† Essay on Iodine, p. 167. Edinb. 1837.

In Dr. Pereira's opinion,* the most effectual method of employing iodine externally is the endermic, — applying an ioduretted ointment to the cutis vera after the epidermis has been removed by a blister. The plan is not, however, often used.

The following are some of the forms in which pure iodine is administered internally and externally: —

Tinctura iodidi.

Tincture of iodine.

Tinctura seu Alcohol Iodii.

R. Iodini, gr. xlvij.

Solve in

Alcohol. 35^o (s. g. .842) ʒj.

Dose. — Ten drops to be given in some mucilaginous or saccharine fluid, or in wine and water.

Coindet and Magendie.

The *Tinctura Iodini*, of the Pharmacopœia of the United States, consists of an ounce of *Iodine* to a pint of *Alcohol*.

Mr. Durand, an able *pharmacien* of Philadelphia, finds, that forty grains of *iodine* and ʒx. of *alcohol* form a saturated solution. Based on this fact, the following formula has been given, which does not seem, however, to possess any advantages over the simple tincture.

R. Iodin. ʒij.

Alcohol. ʒj.

Spirit. lavand. comp. ʒij.

Dose. — Ten to twenty drops, twice a day, gradually increasing it to forty.†

Tinctura ætherea iodini.

Ethereal tincture of iodine.

Tinctura iodii ætherea. — French. *Ether ioduré.*

R. Æther. sulphuric. f.ʒi.

Iodini, gr. iv. M.

Dose. — Eight or ten drops, two or three times a day.

Magendie.

* Elements of Mat. Med. and Therap. 2d. edit. p. 242. Lond. 1842.

† Ellis's Medical Formulary, 6th edit. p. 93. Philad. 1842.

Decoctum cinchonæ cum tinctura iodini.

Decoction of cinchona with tincture of iodine.

R. Decoct. cinchon. f.℥x.
Tinct. iodin. gtt. xc. M.

Dose. — Two spoonfuls, three times a day. In *scrophulous
ulcers.* *Rey.*

Mistura iodini.

Mixture of iodine.

R. Iodin. gr. v.
Alcohol. f.℥ij.

Solve et adde

Aq. cinnam. f.℥iiss.
Syrup. simpl. f.℥iiss. M.

To be taken in the twenty-four hours, in dram doses.

Syrupus iodini.

Syrup of iodine.

R. Tinctur. iodin. gr. vj.
Syrup. simpl. f.℥ij. M.

Henry.

Solutio iodini. (LUGOL'S.)

*Solution of iodine.*French. *Boisson iodée.*

(1. For internal use.)

	A.	B.	C.
R. Iodin.	gr. ½.	gr. ¾.	gr. j.
Sodii chlorid.	gr. xij.	gr. xij.	gr. xij.
Aquæ destill.	Oj.	Oj.	Oj.

Solve

(2. For external use.)

	A.	B.	C.
R. Iodin	gr. ij.	gr. iiij.	gr. iv.
Aq. destillat.	Oj.	Oj.	Oj.

Solve.

Lugol gives formulæ for the solution of the three different strengths above.

Lotio iodini.

Lotion of iodine.

R. Tinct. iodin. f.℥ss.
Ferri iodid. gr. xij.
Antim. chlorid. ℥ss. M.

To be applied by means of a camel's hair pencil, after the corn has been well pared.

James Henderson.

Unguentum iodini.

Ointment of iodine.

Unguentum Iodatum. — French. *Pommade d'Iode.* — German. *Iodsalbe.*

R. Iodin. gr. iij.
Adipis, ℥ij. M.

The UNGUENTUM IODINI of the Pharmacopœia of the United States (1842), is made as follows: —

R. Iodini, gr. xx.
Alcohol. ℥xx.
Adipis, ℥j.

Rub the iodine first with the alcohol and then with the lard until they are thoroughly mixed.

Linimentum iodini.

Liniment of iodine.

R. Linim. sapon. comp. f.℥j.
Tinct. iodin. f.℥j. M.

Manson.

*Cataplasma iodini.**Cataplasma of iodine.*

- R. Tinct. iodin. f. ʒss.
 Pulv. lin. ʒj.
 Avenæ farin, ʒiij.
 Aquæ destillat. q. s. ut fiat cataplasma.

Used as a cataplasm in *scrophulous tumours*, and *goître*.

Iodide of Starch, *Iodidum seu Ioduretum Amyli*, *Amylum Iodatum*; FRENCH, *Iodure d'Amidon*; GERMAN, *Iodstärkmehl*, *Iodstärke*, *Stärkmehl-oder-Satzmehliodüre*, has been extolled by Dr. Andrew Buchanan,* of Glasgow. It is prepared of *iodine* gr. xxiv.; *starch*, in fine powder, ʒj. The iodine is first triturated with a little *water*, and the starch is gradually added, the trituration being continued till the compound assumes a uniform blue colour. The iodide is then dried with a heat so gentle as not to drive off the iodine, and it must be afterwards kept in a well stopped bottle.

Iodine, in the usual forms of exhibition, is not in general given in larger doses than four or six grains daily, whilst, in the above formula, Dr. Buchanan has given as much as seventy-two grains daily.

Professor Forget, of Strasbourg, has published the case of a youth, seventeen years of age, who took, in 48 days, 139 ounces, or nearly nine pounds, of this iodide, containing 3336 grains, or nearly six ounces, of iodine, — being nearly sixteen grains a day.†

It is proper, however, to state, that Dr. Laurie, of Glasgow,‡ thought it proved fatal in a case, in which not more of the iodide than corresponded to a grain of iodine, had been given twice a day for five days.

Iodide or Ioduret of Quinia, *Iodidum Quiniæ*, is formed by precipitating *sulphate of quinia* by means of *iodide of potassium*. It is a yellow precipitate, soluble in alcohol, and crystallises from this solution in quadrangular prisms. It has been employed for the cure of *scrophulous tumours*, in cases where iodine and tonics are indicated.§

* Lond. Med. Gazette, July 2, 1836; see, also, Soubeiran, in *Revue Médicale*, Août, 1837.

† *Gazette des Hôpitaux*, Fev. 19, 1839, and *Lond. Med. Gaz.* April 20, 1839, p. 127.

‡ *Lond. Med. Gaz.* July 3, 1840, p. 590.

§ *Journal de Chimie Médicale*, Mars, 1836.

Iodide of Ammonium, *Iodidum seu Ioduretum Ammoniaë*, *Hydriodate of Ammonia* (in solution), *Ioduret of Ammonia* — is formed by saturating *liquid hydriodic acid* with *caustic ammonia* and evaporating the solution. It crystallises with difficulty and is deliquescent. It was introduced into medical practice by M. Biett, of Paris, as a valuable therapeutical agent in *certain diseases of the skin*. Several successful cases of its employment in *lepra* and *psoriasis*, by M. Biett, are given by Dr. Pennock,* accompanied by interesting remarks by the latter. It is administered in the form of ointment,—from a scruple to a dram of the *iodide* being added to an ounce of *lard* — the weaker ointment being used in milder or more acute, and the latter in more inveterate cases. The ointment should be freshly prepared, or kept excluded from the air as it is readily decomposed.

The other preparations of iodine are contained in different parts of this volume.

XCIV. JUGLANS REGIA.

SYNONYMES. Walnut Tree.

French. Noyer.

German. Wallnussbaum.

The walnut tree, SEXUAL SYSTEM, Monœcia Polyandria: NATURAL ORDER, Terebinthaceæ or Juglandææ, is a native of Persia, whence it passed into Greece, Italy, France, &c.

EFFECTS ON THE ECONOMY.

The leaves of the walnut have been highly extolled by M. Négrier† as superior to all other antiscrophulous remedies. He prescribed them to 56 patients affected with different forms of *scrophula*. Of these, 31 were unequivocally cured, 18 experienced a very manifest improvement, and the majority were in course of cure. Four derived no benefit as regarded their

* Amer. Journ. of the Med. Sciences, Feb. 1835, p. 374.

† Archiv. Général. de Médecine, Avril et Mai, 1841, and Bullet. Général. de Thérapeutique, 15 et 30 Mai, 1841.

sores. Four children died during the treatment, — two of tubercular phthisis ; one of acute encephalitis, and the fourth of double pneumonia. The extract of the leaves, which may be ranked in the class of slightly aromatic bitters, M. Négrier found to be almost constantly efficacious in *scrophulous affections*, and in no case did he observe it exert any unpleasant action on the economy.

The preparations of walnut leaves excite, in the first instance, the functions of digestion and circulation, and, according to M. Négrier, communicate remarkable energy to all the functions ; and he is disposed to think, that they have a special action on the lymphatic system.

MODE OF ADMINISTERING.

The preparations used by M. Négrier are the following :—

Infusum juglandis regiæ.

Infusion of walnut leaves.

This infusion is made by throwing a large *pugillus* (*pincée*) of the *cut leaves* into eight ounces of *boiling water*. This is sweetened with sugar or with the syrup mentioned below. Two or three cups were prescribed daily, and sometimes as many as five.

Decoetum juglandis regiæ.

Decoction of walnut leaves.

The decoction may be made by boiling, for ten or fifteen minutes, a small *manipulus* (*poignée*) of the *leaves* in Oijss. (*kilogramme*) of *water*. It is advantageously used as a lotion ; and as a dressing to scrophulous ulcers, — lint being wetted with it and applied to them. It has, also, been used as a partial and general bath ; and as an injection into fistulous openings.

Extractum juglandis regiæ.

Extract of walnut leaves.

This extract is prepared by the method of displacement.

*Syrupus juglandis regiæ.**Syrup of walnut leaves.*

The syrup is prepared from the *Extract* by mixing six grains with an ounce of *simple syrup*. A syrup may, also, be made of the green leaves, which is more aromatic than that formed from the extract. To little children M. Négrier gives two or three dessert-spoonfuls in the 24 hours; to adults he has never given more than two ounces. The ordinary dose for the last is from eight to ten drams.

*Pilulæ juglandis regiæ.**Pills of extract of walnut leaves.*

Each of these may be made of three grains of the extract rendered solid by a sufficient quantity of the powder of the leaves. Two are given by M. Négrier in the day. He has never exceeded four.

Where it has been necessary to have recourse to frictions on the diseased part, he has employed the following ointment :

*Unguentum juglandis regiæ.**Ointment of walnut leaves.*

- R. Extract. juglandis regiæ, $\overline{3}$ i.
 Adipis, $\overline{3}$ x.
 Ol. bergamot. \mathfrak{m} ijj.

The friction must be gentle, and for about a quarter of an hour, twice a day.

M. Négrier properly remarks, that in all such deeply rooted affections, it may be necessary to persevere in the remedy for some time; as not only have we to combat the effects of the disease, but to induce a profound modification in the constitution of the individual.*

Injections of a very concentrated decoction of walnut leaves, of the temperature of the room whatever may be the season, have been used with much success in *leucorrhæa* by M. Vidal.†

* Archiv. Général. de Médecine, Mai, 1841, and Encyclographie des Sciences Méd., Juin, 1841, p. 466.

† Essai sur un Traitement Méthodique de quelques Maladies de la Matrice, &c. Paris, 1840; noticed in Brit. and For. Med. Rev. for July, 1841, p. 215.

XCV. LACTUCA'RIUM.

SYNONYMES. Lettuce Opium, Thridace.

German. Lattig-Opium, Lattigmilchsaft, Lattigbitter.

The ancient Greek and Roman physicians were well aware of the hypnotic property of the common garden lettuce (*lactuca sativa*), the milky juice of which contains *lactucarium*. It would appear, however, that Dr. J. R. Coxe, of Philadelphia, was the first to propose the use of the inspissated juice in medicine.* Dr. Duncan, Senr., of Edinburgh, subsequently paid particular attention to the subject, and recommended it as a remedy in *phthisis*, in place of opium.† The properties of the juice have also been investigated by M. François,‡ a French physician.

METHOD OF PREPARING.

There are three kinds of *lactucarium*. The *first* and best, but the most costly, is obtained from incisions made into the stalks, whence the juice exudes, which is subsequently dried in the air. This preparation has a bitter taste, soon becomes of a brown colour, and solid; has a gummy fracture, but absorbs moisture from the air, becoming soft and clammy.

The *second* variety is obtained by expression of the selected stalks, and subsequent desiccation of the obtained fluid, either in the air or by artificial warmth. This is said to be the variety most commonly met with in commerce;§ and the *third* variety is prepared in the same manner as any common extract, from all parts of the plant. This is the *Thridace* of some.

The first is the strongest and most uniform, and therefore to be preferred.

Chemical examination shows that *lactucarium* contains neither morphia nor narcotina, as had been supposed.

* Wood and Bache's Dispensatory, 4th edit. p. 400. Philad. 1839.

† Observations on Consumption, 2d edit. Edinb. 1816.

‡ Archiv. Général. de Médecine, 1825. Journal Univer. xl. 254, and xli. 147. See, also, Fischer, in Rust's Magazin. B. liii. Heft 1.

§ Riecke, Die neuern Arzneimittel, S. 313; and 2te Auflage, S. 473. Stuttgart, 1840. See, also, Mérat and De Lens, Dict. de Mat. Méd. art. *Lactuca Sativa*.

It has been recently examined by M. Aubergier,* who found it to have the following composition:— Bitter crystallizable matter; mannite; asparamide; free acid; brown colouring matter; resin, cerin, myricin, albumen, and gum; nitrate of potassa; chloride of potassium; and phosphates of lime and magnesia. M. Aubergier regards the crystalline matter as the active principle of the lactucarium.

EFFECTS ON THE ECONOMY.

To investigate these, Rothamel† instituted experiments with the Paris lactucarium. Half a grain to a grain produced little or no effect. From three to five grains occasioned a peculiar indescribable feeling of lightness over the whole body, without any narcotic symptoms or modification in the pulse: from six to eight grains increased this sensation, and caused dilatation of the pupils. The same doses, repeated at intervals of three or four hours, through the day, diminished the number of pulsations of the heart, and the sleep was disturbed. From ten to fifteen grains caused more indisposition, nausea, oppression in the epigastrium, cold sweats, anxious respiration, cold sensation in the chest, great dulness, vertigo, considerable dilatation of the pupils, yawning and stretching, slow pulse, disturbed sleep, general prostration; the tongue to be coated with mucus; disagreeable taste; loss of appetite; pains in the shoulders and bones, and uncertain gait; all which symptoms were speedily removed by a few drops of acetic ether, or a glass of Rhenish wine. Coffee was much less efficacious.

Lactucarium has been extolled by numerous physicians as equally effective with opium, whilst it is not — they assert — followed by the signs of narcosis and other inconveniences, so often induced by the latter. Accordingly, it is frequently given where a pure sedative is needed — to allay cough, and where much nervous excitement is present. It has also been used topically in the form given below, by Rau,‡ of Berlin, in *catarrhal ophthalmia*, and a solution, in the proportion of four grains to the ounce, has been advised in acute *inflammation of the conjunctiva*, by Guibert.§

* Journ. de Pharm. Jan. 1842, p. 78.

† Ferussac's Bulletin des Sciences Médicales, xxii. Paris, 1830.

‡ Berliner. Medicin. central-zeitung, Nov. 2, 1838.

§ Froriep's Notizen, Bd. xxi. S. 320, and Osann. art. *Lactuca*, Encyclopäd. Wörterb. der Medicinischen Wissenschaften, xx. 697. Berlin, 1839.

MODE OF ADMINISTERING.

Lactucarium is given internally, either in the form of solution or pill, in the dose of from one-third of a grain to three grains. Externally, it has been applied in the form of plaster or of ointment.

Mistura lactucarii.

Mixture of lactucarium.

R. Lactucar. ℥j.
 Mucilag. acac. q. s. ad subactionem.
 Perfectè unitis adfunde
 Aq. f.℥vj.
 Syrup. rub. idæi, f.℥ss. M.

Dose. — Two spoonfuls, every two hours, in *spasmodic cough, sleeplessness and hysteria.* Von Hildenbrand.

R. Acid. boracic. ℥ij.
 Lactucarii, ℥j.

Solve in

Aq. destillat. f.℥vj.
 Syrup. papav. f.℥ss. M.

Dose, — A small spoonful — in cases of “*spastic hæmoptysis.*” Rothamel.

Collyrium lactucarii.

Eye-wash of lactucarium.

R. Lactucar. gr. iiij.
 Aq. destillat. f.℥ij.
 Mucilag. cydon. gtt. xx. M.

Rau.

XCVI. MAGNES.

SYNONYMES. Magnet.

French. Aimant, Pierre d'Aimant.

The natural magnet was employed of old both externally and internally, and in the most diversified forms and affections.* The artificial magnet has been used within the last century only.

It is generally on the diseased part, or around it, that the magnet is applied, and the application is made for a longer or shorter time according to circumstances — being at times drawn along the nerves of the affected part: at others applied in a more prolonged manner.

It is on the nervous system — and chiefly through the influence of the imagination — that the magnet exerts its efficacy. Accordingly, the class of diseases in which it has been found most beneficial are those termed "*nervous* and *spasmodic*." This is strikingly shown by the published observations of MM. Andry and Thouret,† Commissioners of the Société Royale de Médecine, appointed to examine into the matter. In cases of *spasms*, *palpitations*, *convulsions*, *epilepsy*, *tremors*, *cramps*, *neuralgia*, *rheumatism*, &c., the only agent employed was the magnet, and it was wholly successful. These gentlemen, however, were disposed to infer, that the magnet exerts an incontestable magnetic action on the nervous system, to which, in part at least, the curative agency must be ascribed, and their conclusions were thought to be corroborated by cases observed by Alibert, Cayol, Chomel, Recamier, &c. The celebrated Laennec,‡ who employed the magnet in the manner recommended by Hallé, that is, by establishing a magnetic current through the diseased parts by means of several magnetised plates, affirms, that he frequently found it moderate the pain in *pulmonary neuralgia*, diminish the oppression in *nervous asthma*, suspend *spasmodic hiccough*, and exhibit its utility in *simple neuralgia of the heart*, and in *angina pectoris*. In the last disease, the application of a small blister under the anterior plate appeared to render the effects of the magnet more marked.

It is not many years since considerable interest was excited in

* Art. Aimant, in Dict. Univers. de Matière Médicale, par Mérat and De Lens.

† Mém. de la Société Royale de Médecine de Paris, pour 1776, p. 531, and Thouret, Art. Aimant, in Encyclopéd. Méthod. Partie Médicale, i. 421. Paris, 1786.

‡ Traité de l'Auscultation Mediate, 2de édit. tom. ii.

London by the success, said to have been obtained in the treatment of *neuralgia*, *toothach*, and *other affections of the nerves*, by the application of the ordinary magnet or "*mineral magnet*," as it was termed by Dr. Blundell who employed it.*

It would seem, too, that owing to a considerable demand for loadstone, the conductors of the *Bulletino delle Scienze Mediche*,† of Bologna, were led to make inquiries concerning the uses to which it was put. From these it appeared, that the Ex-Bey of Algiers, whilst at Leghorn, in 1831, mentioned to a Catholic dignitary, Father Campagnoli, who was suffering under *gout*, that the application of the loadstone was an oriental remedy for the disease, and of certain efficacy. He immediately procured a piece of loadstone, as he had been subject to regular and frequent attacks of gout since 1805, and its application removed the next paroxysm. Since this time, he has always had recourse to the same remedy, and has found, that the attacks come on less frequently and severely, and that they invariably yield, so that he has rejected all his former plans of treatment. On the first symptom he goes to bed, and places the loadstone in close contact with the pained part; he presently falls asleep, and awakes free from pain, and able to walk. The loadstone, which he uses, weighs five pounds, and has smooth sides. He has recommended this plan to other gouty individuals, who have experienced similar relief.

The Author has witnessed the application of the mineral magnet repeatedly in *nervous diseases*, in persons of highly impressible habits; but except in such, and apart from the effects of the imagination, he has seen no beneficial results from it.

XCVII. MANNITA.

SYNONYMES. Mannitum, Saccharum Mannæ, Mannite, Sugar of Manna.
German. Mannit, Mannazucker, Mannastoff.

This principle, which was first discovered by Proust, belongs to the varieties of sugar that are not susceptible of fermentation, and constitutes the chief ingredient of manna. Its presence is not confined, however, to that substance. It is met with in several other vegetable juices — cucumbers, melons, celery, beets, &c. Yet in these it is first found after fermentation, so that che-

* See *Lancet* for 1833, and *American Journal of the Medical Sciences*, Nov. 1833, p. 247.

† *Marzo et Aprile*, 1835; and *British and Foreign Medical Review*, July, 1836, p. 246.

mists have been disposed to regard it as a product of fermentation.*

METHOD OF PREPARING.

Mannite is commonly procured from manna. Manna *in lachrymis*, as it is obtained in commerce, is treated with *boiling alcohol*, filtered, and suffered to crystallise : by rest and refrigeration, mannite is precipitated in small, beautiful, white needles. The manna in tears consists almost wholly of mannite. Common manna, on the other hand, contains but little thereof, and in its place has a yellow extractive matter to which cathartic properties have been assigned : coarse manna consists almost wholly of the latter. To obtain mannite, consequently the manna in tears is selected.

Should the administration of mannite, as a remedial agent, become more common, it may be worth the trouble to inquire, whether it might not be advantageous to prepare it from the vegetable juices above mentioned.

Mannite, prepared in the above manner, is of a white colour ; soluble in five parts of cold water, and in almost every proportion in boiling water ; it seems to be entirely insoluble in cold absolute alcohol ; is somewhat more so in boiling alcohol, and still more so in boiling alcohol which contains water. At from 221° to 230° Fahrenheit, it melts into a colourless, adhesive fluid and crystallises on cooling. When more strongly heated, it burns, and is decomposed like sugar. From its alcoholic solutions it separates on cooling, in white, silky, shining, needle-shaped crystals, collected in stelliform roundish masses.

When mannite is dissolved in an equal weight of boiling water, and the fluid is evaporated by a strong fire and rapid ebullition, until a small portion placed on a cold glass plate rapidly becomes solid, it may be poured out into shapes.

The taste of the sugar of manna is feeble, but agreeably sweet : it is inodorous, or at least nearly so. According to Liebig, mannite consists of 40.0228 of carbon, 7.6234 of hydrogen, and 52.3537 of oxygen.

Granatin or *Grenadin* of pomegranate root agrees so much with mannite in its properties, that both have been regarded as the same substance.

EFFECTS ON THE ECONOMY.

According to Magendie,† mannite may be advantageously substituted for manna, as it possesses the cathartic property without

* Art. Mannite, in Mérat and De Lens, Dict. de Mat. Méd.

† Formulaire, &c. dern. edit.

the nauseous flavour. The dose is two drams for children, and, at times, as much as half an ounce; but, in the latter dose, Magendie always found the catharsis too active; for this reason he considers it to be the best dose for the adult. He recommends, that a syrup should be prepared from it, and that this should be prescribed both as a cathartic for children at the breast, and as an addition to other articles in cases of *pulmonary catarrh*.

M. Solon has likewise spoken favourably of the therapeutical advantages of mannite. He administered it in three cases of *gastricism*—in two of them combined with castor oil—in which it induced, in a few hours, critical evacuations; and in a case of *peritonitis occasioned by obstinate constipation*, its use was followed by the best effects. In the last case, the inflammation completely disappeared, as the constipation yielded, without any other agency. It was found, likewise, of essential service in *convalescence from bronchitis and pneumonia*. Only in two cases of females—the one labouring under *ascites*—the other under *phlegmatia dolens*, did mannite fail to have any aperient agency. This, it was presumed, was probably owing to both of the patients having been habituated to the use of powerful cathartics, and to there not being enough of the preparation to admit of the administration of the appropriate quantity.

According to Solon, mannite may be given in the dose of one or two ounces dissolved in from two to four ounces of a hot aromatic water, the solution to be taken warm, otherwise it forms a stiff, adhesive mass; or it may be added to ordinary cathartic potions. He assigns it the preference over manna and castor oil; *first*, because it has an agreeable saccharine taste, and *secondly*, because it is always equally good; whilst those substances are often deteriorated, and on that account uncertain in their effects. It appeared to him to be peculiarly adapted for cases in which it was desirable to evacuate the intestines with as little excitation as possible.

Magendie, in his lectures on the blood, classes mannite amongst the substances that promote the coagulation of that fluid.*

XCVIII. MATIAS.

A paper on the Matias Bark was read before the Medical Section of the British Association for the Advancement of Science at their meeting in 1840, by Dr. M'Kay. The plant, from which

* Leçons sur le Sang, &c., &c. Translation in Lond. Lancet for Jan. 26, 1839, p. 636.

the bark was obtained, grows in great abundance in South America; but its botanical characters have not been given. From what Dr. M'Kay heard, it would seem to belong to the genus *Wintersonia*. It contains an intensely bitter extractive matter, and yields, on distillation, two distinct essential oils, which differ in specific gravity, and are soluble in alcohol and ether; and but very sparingly so in water. The principal characteristic substance derived from it was a bitter resinous matter. No alkaloid was discovered in it.

EFFECTS ON THE ECONOMY.

In its native country, matias bark is extensively used as a substitute for cinchona in *intermittents*. Its principal therapeutical properties are tonic, aromatic and astringent. Dr. M'Kay stated, that it had been exhibited with marked success in *dyspepsia* accompanied by loss of appetite, which it quickly restored. In *phthisis*, where tonics were admissible, it supported the strength and prevented rapid sinking. In dropsy, it was found to be a valuable adjunct to diuretics; and in *intermittents*, to deserve its native reputation of being a good substitute for cinchona.

The virtues, ascribed to it by Dr. M'Kay, were confirmed by Dr. Neubigging, who has used it extensively.*

XCIX. MONE'SIA.

This vegetable substance has been imported into Europe, from South America, within the last few years; and, in consequence of the trials that have been made with it, by the French practitioners more especially, it was introduced in the year 1840 into this country. It is imported into France in the form of hard, thick cakes, weighing upwards of twenty pounds. These cakes or loaves are much flattened, and have a yellowish coloured paper strongly adhering to them.† They are composed of an extract, prepared in South America from the bark of a tree, the botanical name of which is yet unknown. It would seem, that

* Lond. Athenæum, Oct. 1840; and Amer. Journ. Med. Sciences, Jan. 1841, p. 209.

† Martin Saint-Ange, Gazette Médicale de Paris, Oct. 19, 1839.

a French merchant, who had dwelt for a long time in the interior of South America, and had witnessed the surprising effects in certain diseases, from the employment of an extract, which the natives made from the bark of a tree of the country, determined to import it into France, and to submit it to the experiments of his medical and pharmaceutical countrymen.* A quantity of the drug was accordingly sent to Paris, and placed in the hands of M. Derosne. About a year and a half after this, he obtained some specimens of the bark of the tree, from which he procured an extract presenting all the characters of the extract previously sent to him, and identical in its composition. This bark is said, by M. Derosne, to be called by some travellers *Goharem*, and, by others, *Buranhem*; and the naturalists, who have examined it there, think that the tree, which furnished it, is a *Chrysophyllum*.† The bark of the Monesia is smooth and grayish like that of the plane tree; but with this difference, that it is much thicker; that its fracture is imbricated, and that its sweet taste contrasts singularly with the bitterness of the thin laminæ that are detached from the plane tree.

The extract is of a deep brown colour. It is very friable, and its fracture presents the same appearance as that of a well torrefied Cacao Nut. It is wholly soluble in water, and its taste, — which is at first sweet like liquorice, — soon becomes astringent, and leaves behind a well-marked and enduring acrid impression, which is felt especially in the tonsils.

Chemical analysis of the bark has detected the following soluble principles: — Chlorophylle; vegetable wax; a fatty and crystallizable matter; glycyrrhizin; an acrid and slightly bitter matter; a little tannic acid; an organic acid, not studied; a red colouring matter, analogous to that of cinchona; phosphates of lime and magnesia; and salts of lime, with an organic acid.‡ The extract contains nearly 8 *per cent.* of glycyrrhizin, and 20 *per cent.* of acrid matter (*monesin*); and no difference was found by M. Derosne on analysis between the imported extract and that prepared from the bark.

An analysis by M. Persoz,§ Professor at the *Académie des Sciences*, of Paris, gave the following as the constituents of the

* Bernard Derosne, Notice sur le Monésia, Paris, 1839; and Sigmond, Lond. Lancet, 1840.

† See a Translation of a Communication by M. Saint-Ange, in Lond. Med. Gazette, Dec. 20, 1839, p. 491; in American Journal of Pharmacy, July, 1840, and in Dunglison's American Med. Intel. March, 1840, p. 363.

‡ Bernard Derosne, and O. Henry, in Notice sur le Monésia, par B. Derosne; and in Tableau Synoptique, &c., du Monésia, par M. Saint-Ange. See also, Saint-Ange, in Op. cit., and MM. Bernard Derosne, O. Henry and J. F. Payen, in Journal, de Pharmacie, Janvier, 1841, p. 20, and in Journ. des Connois. Méd. Chir. Jan. 1841.

§ Forget, Bulletin Général de Thérapeutique, Avril, 1839.

extract : — Tannic acid, rendering iron blue, 52 ; gum or mucilage, 10 ; sweet matter, 36 ; loss, 2.

It has been recently suggested, that the bark of the *Monesia* is identical with that of the *Quillaia Saponaria*, of Chili. Neither the bark nor the extract would seem, however, to be identical, although in certain respects they resemble each other : moreover, the analysis of the *Quillaia* was made by MM. Henry, fils, and Bourtron-Charlard, and if the *Monesia* and the *Quillaia* were the same, the identity could not have failed to be detected, by these able chemical analysts.*

EFFECTS ON THE ECONOMY IN HEALTH.

When monesia is exhibited internally, in the dose of from 15 grains to a scruple of the extract, daily, for eight or ten days, it exerts, at first, a direct operation on the digestive passages, and accelerates, in a remarkable manner, the action of the stomach. If the dose be pushed to a dram or more in the day, and it be continued for fifteen or twenty days, the appetite increases, but a feeling of heat is experienced in the epigastric region ; and tenesmus and obstinate constipation may likewise supervene.† Its action is manifestly excitant, and slightly astringent, and as such it may be adapted for many pathological conditions in which such agencies are indicated.

EFFECTS ON THE ECONOMY IN DISEASE.

Being possessed of the properties described above, monesia has been used in the various profluvia, and especially in such as are of an atonic character.

In *chronic bronchitis*, and *bronchorrhœa*, it has been successfully employed by Alquié, Dagnac, Manec, and others, — sometimes alone, at others associated with opium ; and, in the majority of cases, benefit has appeared to accrue from its use. The same has been the result in *hæmoptysis*, according to Alquié. On *phthisis*, it of course exerted no direct efficacy ; but its administration appears to have been followed by increased tone of stomach ; and facility of expectoration. The first of these results has led to its use in *languor of the digestive functions* ; and it

* See, on this subject, Drs. Chaloner and Ruschenberger, in *Dunglison's Amer. Med. Intel.* Sept. 15, 1840, p. 184–187. Mérat and De Lens, art. *Quillaia* ; and the analysis of the *Quillaia*, by Bourtron, Charlard, and Henry, fils, in *Journal de Pharmacie*, xiv. p. 247 ; and in *Amer. Journ. Pharmacy*, for Oct. 1840, p. 210, with remarks by Dr. Carson, the editor.

† Martin Saint-Ange, *Op. cit.*

has been given as a tonic to females, who have been exhausted either by antecedent maladies, or by uterine hemorrhage. In one case,* where the debility was so great that syncope was induced on the least movement of the body, the extract was given in pills in the dose of sixteen grains in the course of the day, with the best effect.

In *chronic enteritis*, it has been prescribed by Alquié, Baron, Manec, Monod and others, and, in many cases with decided advantage. Its success is said to have been most marked in *diarrhœa*, especially when owing to improper diet and several fortunate results have been published by M. Adrien;† and by Dr. Q. Gibbon, of Salem, N. J.‡ Even in the *colliquative diarrhœa* of phthisis it has acted beneficially. B. Derosne affirms, that surprising results have followed its administration in the *diarrhœa of phthisis with intestinal ulceration*, after all astringents had been employed to no purpose. Notwithstanding the disadvantageous circumstances in such cases, monesia is said to have constantly mastered the diarrhœa. Dr. Joseph S. Nancrede,§ gave it successfully in a case of *diarrhœa of long standing*, and Dr. Burns|| in two cases of *chronic diarrhœa succeeding to cholera infantum*.

In *leucorrhœa*, the efficacy of monesia, as of every other astringent, is less marked than in diarrhœa. Where the internal treatment is alone employed, the astringent has probably to pass into the mass of blood, and in this manner to act upon the parts concerned, whilst in every form of chronic enteritis, it can come into immediate contact with the seat of the disease. Injections of monesia have accordingly been more advantageous in leucorrhœa. M. Baron, after having employed all the ordinary means in a case of *inflammation of the vagina*, had recourse to them, and arrested the discharge. M. Payen gives a case in which, when taken internally, it augmented the discharge, but when it was employed in the form of injection, the discharge yielded, and did not recur.

In all the cases of *metrorrhagia* or *uterine hemorrhage*, in which monesia has been given, it is said to have succeeded in moderating or suppressing the flow more perfectly than other agents. It has been given, with excellent effects, in these cases by MM. Daynac, Payen, Alquié, and Martin Saint-Ange. In an obstinate case of *menorrhagia*, of seven weeks duration, after the usual agents had been employed in vain, Dr. Chaloner¶

* Bernard Derosne, Notice sur le Monésia, p. 7.

† Journ. des Connois. Méd. Chirurg. Nov. 1840.

‡ Dunglison's Amer. Med. Library, Jan. 1842, p. 143.

§ Philadelphia Medical Examiner, April 4, 1840, p. 215.

|| Ibid. Aug. 15, 1840, p. 517.

¶ Philad. Med. Examiner, July 11, 1840, p. 441.

administered the extract in the dose of three grains in the form of pill, every hour and a half, until an effect on the discharge was manifest. After three pills had been taken, benefit was experienced, the patient was then directed to take three more,—one every two hours. The cure was complete. It is proper to add, that perfect rest, and cold drinks were used at the same time ; and the same may be said of a successful case reported by Dr. Burns.*

In *blennorrhœa*, it has exerted but little action, when administered by the stomach ; but, when injected into the urethra, it effected a cure in half the cases, and diminished the amount of the discharge in the other half.† In a case of well marked *scorbutus*, with petechiæ of the inferior extremities, soft and bleeding gums, and frequent epistaxis, which had required plugging of the nasal fossæ, M. Laurand obtained a complete cure, by giving, daily, from 24 to 40 grains of the extract in the form of pill, washing the mouth, at the same time, with a collutory formed of a dram of the *tincture* to four ounces of *honey* and *water*, and inhaling, by the nostrils, acidulated water, containing an ounce of the *tincture* to a pint of *water*.

In two cases of *scrophula*, the tincture was used internally by M. Dagnac, and with excellent effects.

In *ulcers* of a bad character, monesia has been applied externally with advantage ; sometimes, in the form of ointment ; at others, of the powdered extract. In *venereal* and *scrophulous ulcers*, excellent effects were obtained from it by MM. Baron and Martin Saint-Ange. M. Manec used it with benefit in an obstinate *serpiginous ulcer* of long duration. M. Monod cured a *phagedenic ulcer* by it, which had resisted the use of the nitrate of mercury and the arsenical paste. M. Payen was equally successful with an *ulcer on the lower jaw*, which, for ten months, had resisted all treatment, internal as well as external. He employed it likewise with much success in *ulcerated chilblain* ; in two cases of *stomatitis*,‡ one of a gangrenous character ; and in cases of *fissure of the anus*, the result of *inflammation from hemorrhoids*.

Two cases of *purulent ophthalmia* were cured by M. Saint-Ange ; and M. Laurand was equally fortunate in a case of *gangrenous sloughs* on the region of the sacrum.

M. Buchey, Surgeon Dentist, has employed the extract of monesia in cases of *caries of the teeth*, the progress of which it appeared to him to retard, and, when united with opium, it seemed to assuage the pain more than when the latter was given singly.

* Ibid. Aug. 15, p. 517.

† Martin Saint-Ange, Op. cit.

‡ See, also, J. G. Nancrede, Op. cit.

He recommends the use of the tincture to maintain a good state of the *gums*.*

Such are the chief diseases in which monesia has been used. Its employment can readily be extended to others, by bearing in mind the nature of its powers.

It would appear, that experiments have been made in Dublin, and that much benefit had been derived from it as an astringent.†

MODE OF ADMINISTERING.

Monesia is generally given in pills of the EXTRACT, in the dose of twelve to forty grains a day ;— the medium dose, in the twenty-four hours, being fifteen to twenty grains, taken at twice or thrice. M. Martin Saint-Ange has given it to the extent of forty-five grains a day.

The SYRUP, which contains six grains of extract to the ounce, is given less frequently. It is esteemed to be less active than the pure extract, and is preferred only in the case of infants.

The HYDRO-ALCOHOLIC TINCTURE, which contains thirty-two grains of extract to the ounce, has been most commonly used in injections, in the proportion of a dram, to a dram and a half, to six ounces of water. It has also been prescribed internally in the dose of one or two drams a day in a bitter infusion.

For external use, an OINTMENT, containing one-eighth part of its weight of the extract, has been applied to ulcers ; at others, the powdered extract, and at others, again, the acrid matter itself referred to in the analysis.

MORPHIA ET EJUS SALES.

SYNONYME. Morphia and its Salts.

C. MOR'PHIA.

SYNONYMES. Morphina, Morphinum, Morphium, Morpheum, Morphia, Morphine, Papaverine.‡

German. Morphin, Mohnstoff, Opiumalkaloid.

The discovery of this principle is ascribed to Séguin and Sertürner, who were engaged in the chemical analysis of opium upwards of thirty years ago ; but although the former may have

* Bernard Derosne, Notice sur le Monésia, &c., &c.

† Sigmond, *Op. cit.* See, also, Forget, *Bulletin Général de Thérapeutique*, Avril, 1839.

‡ Jahn's *Handwörterbuch der Chemie*, B. iii. S. 150.

first detected it, the latter deserves the credit of having improved our acquaintance with it, and of having attracted to it the attention of chemists and physicians.

METHOD OF PREPARING.

The following is M. Robiquet's method :*— he boils a very concentrated solution of *opium* with a small quantity of *magnesia* — ten grains of the latter to a pound of opium — for a quarter of an hour. By this means, a tolerably copious, grayish precipitate is formed, which is collected on the filter, and washed with *cold water*. The well dried precipitate is then digested with *weak alcohol* for some time, at a temperature short of ebullition ; by which means a very small quantity of morphia, and a considerable quantity of colouring matter, are separated. The liquid is then filtered, and the residue washed with a little *cold alcohol*. It is then boiled for some time in *pure alcohol*, and filtered again, whilst the liquid still boils. On cooling, the morphia is obtained, which, by repeated crystallisation, may be freed from the attached colouring matter.

The process of Hottot is greatly followed in France. It is a modification of that used by Sertürner, and similar to that adopted in the Pharmacopœia of the United States. In this, *opium* is exhausted by *tepid water*, and the clear liquid is evaporated to a density of 2° of Beaumé. Whilst the liquid is still tepid, a small quantity of *ammonia* is added, in order to render it neutral or even slightly ammoniacal. In this manner, a brown, resinoid precipitate is thrown down, which contains only traces of morphia and narcotina. The liquor is filtered, and by the addition of a fresh quantity of *ammonia* to it when cold, crystalline morphia is thrown down, which, when collected, dissolved in *alcohol*, and evaporated, is set aside to crystallise.†

Dr. F. Bache regards the process of the U. S. Pharmacopœia as an improvement upon the last, and as being essentially the same with that of Dr. Edward Staples, which was published in the Journal of the Philadelphia College of Pharmacy.‡

Mr. Brande considers the process proposed by Robertson and Gregory to be the simplest and the best.§ *Chloride of calcium* is added to a strong aqueous solution of *opium* to precipitate the

* Annales de Chimie et de Physiq. v. 276.

† Journal de Pharmacie, x. 479.

‡ Vol. i. p. 15 : see Dispensatory of the United States, by Drs. Wood and Bache, 4th edit. Phil. 1839. For Fauré's process, see Journal of the Philadelphia College of Pharmacy, ii. 71. Philad. 1831 ; and for Mohr's process, Journal de Pharmacie, and Amer. Journ. of Pharmacy, April, 1841, p. 60.

§ Dictionary of Materia Medica, p. 383. Lond. 1839.

acids by which the alkaloids are held in solution; it is then filtered and evaporated to the consistency of syrup, and set aside to crystallise; the crystals are strongly pressed to squeeze out the mother liquor, which contains narcotina and other impurities. The pressed crystals are then purified by solution, crystallisation, and the action of animal charcoal, till they are obtained colourless; they consist of the chlorohydrates of morphia and codeia; these are dissolved in *hot water*, and *ammonia* is added, which throws down morphia, and which, being separated upon a filter, may be redissolved in *boiling alcohol*, and obtained in crystals. The liquor, from which the morphia has been precipitated, contains codeia, together with chlorohydrate of ammonia, and some morphia; it must be evaporated until it crystallises, and the crystallised mass must be dissolved in a small quantity of *water*, and be decomposed by excess of a solution of *caustic potassa*; codeia is thrown down, and, when redissolved in ether, may be obtained in crystals. See CODEIA, p. 170.

In the London Pharmacopœia, morphia is directed to be prepared from the hydrochlorate or muriate. Take of *Hydrochlorate of morphia*, ʒj.; *Solution of ammonia*, f.ʒv.; *Distilled water*, Oj. Add the hydrochlorate of morphia, dissolved in a pint of water, to the solution of ammonia diluted with an ounce of water, and agitate. Wash the precipitate with distilled water, and dry it with a gentle heat.

Tilloy, Petit, and others, have obtained morphia on the large scale from domestic opium.*

The crystals are completely white, translucent, almost transparent, and slightly opaline; they are wholly inodorous. In the form of powder, it is of loose texture, and as fine as magnesia. It melts at a trifling degree of heat, and very much resembles in this state, melted sulphur; but crystallises again on cooling. It is sparingly soluble in hot water; and in cold water scarcely at all so. Boiling water, according to Choulant, dissolves one eighty-second part; according to Jahn, only one four-hundredth; and according to Bally,† it is even less soluble than strychnia, which, he says, requires 6000 parts of water for its solution. It is more readily soluble in alcohol, and still more so in ether, as well as in fixed and volatile oils: the solutions have a nauseous, bitter taste. It is alkaline in its nature. The crystals appear to be rectangular foursided prisms. With all the acids, it forms peculiar, readily soluble, and very bitter salts, of which the sulphate, acetate, and muriate are the most used.

* Art. Morphine, in Mécat and De Lens, Dict. de Mat. Méd.

† Mémoire de l'Académie Royale de Médecine, i. 99.

EFFECTS ON THE ECONOMY IN HEALTH.

Generally — it has been affirmed — morphia acts on the nervous system like opium, but does not exert the same agency on the vascular system. Magendie* asserts, that it possesses all the advantages of opium without any of its disadvantages. Bally† took especial pains to investigate the effects of morphia on the organism, and the results were communicated to the *Académie Royale de Médecine*, of Paris. The most striking was its action on the brain, which, when sufficient doses were administered, appeared to cause death by sanguineous apoplexy, as Bally had an opportunity of observing, in one case, on dissection. In this, there were no traces of injection of the membranes of the brain, whilst under the arachnoid much albuminous serum was effused, and there was an extravasation of blood into the left hemisphere of the brain.

This result is especially to be apprehended in those persons who have experienced an apoplectic attack previously. Bally found, moreover — which does not accord with our experience — that morphia was more soothing and soporific in small doses than in larger. It occasioned, in the latter case, cerebral confusion, vertigo, perversion of the senses, and a feeling of electric agency, which commenced in different parts of the trunk and also in the extremities; but no delirium supervened, and the intellectual faculties experienced no alteration. In consequence of these effects on the sensorium, the energy of the motory apparatus suffered. By long administration, morphia, like opium, excited troublesome tremors. Bally found the pupils contracted under its use, when larger doses were given, which is entirely opposed to the ordinary effect of narcotic agents. Not unfrequently, when morphia was continued, the soothing and soporific effect was preceded, for some days, by restlessness, and loss of sleep. Very often it excited headach. On the vascular system it did not act as an excitant — neither rendering the pulse quicker, more frequent, nor tenser. The opposite effect seemed, indeed, to be induced. It has no action, Bally affirms, as an emmenagogue; produces no diaphoresis — which does not, by the way, at all accord with the author's observation — does not even augment the animal heat, or redden the face, but frequently causes itching either over the whole surface of the body, or topically; in the latter case, the sensation being chiefly felt in the face, neck, loins or genitals. At times, the itching is associated with

* Formulaire pour la Préparation, &c. de plusieurs nouveaux Médicamens.

† Revue Médicale, Février, 1824; and Mém. de la Société Royale de Médecine, i. 142.

an eruption of conical wheals or bumps, which are either red or of the ordinary colour of the skin, and can generally be detected more readily by the touch than the sight. On the organs of respiration, morphia exerts no influence; and as to its effects on the digestive organs, it may be remarked, that it has no agency on the mouth, pharynx, or œsophagus, except that ptyalism has been observed to result from it. The tongue is not made red or dry, nor are the tonsils. It does not excite thirst; but, at times, there is a sense of bitterness in the mouth, which is a forerunner of its effects on the stomach. The appetite is not diminished, except when its emetic properties are developed in a high degree. Vomiting is not caused by large doses only, but in many individuals by small doses, and it may be very violent. Commonly, morphia causes constipation, on which, at times, diarrhœa supervenes. Very frequently, also, colic is induced by it.

Morphia possesses, according to Bally, vermifuge properties. In men, he found it excite frequently ischuria, but not in women. The urine, however, exhibited no change of character.*

The author's own view of its action — when no idiosyncrasy interferes with its ordinary operation — is, that it exerts a decided sedative influence on the nervous and sanguiferous systems; and this accords with the experiments instituted on animals by Mr. Blake.† He found, when it was introduced into the veins, that it exhibited its effects upon the heart, by rendering its pulsations slower, and diminishing the pressure of the arterial system.

As in the case of opium, the system may, under excessive pain or long continued use, be so habituated to its action as to bear very large doses. Mr. Lingen‡ of Hereford, has published a case in which a female, under a painful affection, took scruple, and, according to her own report, half dram doses of the acetate; and Mr. Teevan,§ of London, one of a gentleman, labouring under a disease of the spinal cord, attended with violent spasms of the muscles of the chest, abdomen, and inferior extremities, who took, on one occasion, twenty-five grains in the twenty-four hours.

EFFECTS ON THE ECONOMY IN DISEASE.

Morphia, it is thought, may often be administered advantageously, not only where opium is indicated, but where it disagrees.

* Richter's *Specielle Therapie*, 2te Auflage, S. 358. Berlin, 1828.

† Edinb. Med. and Surg. Journ. April, 1839, p. 344.

‡ Lond. Lancet, Jan. 26, 1839, p. 680.

§ Ibid. for Feb. 9, 1839, p. 738.

Riecke* remarks, that where diaphoresis is needed, it cannot supplant opium; but in this we apprehend he is mistaken, at least in febrile and inflammatory diseases. In such cases, the author has observed a sedative dose of opium succeed in restoring the cutaneous transpiration more effectually than any other agent, by allaying the pathological condition on which the suppression of perspiration was dependent. With many persons, and in many cases, it possesses decided advantages over opium, but the author has often found where opium disagreed, that morphia and its preparations did so likewise.

As a general rule, it may be said, morphia is proper, where opium, in sedative doses, is demanded; hence it is had recourse to in *febrile and inflammatory diseases*, where there is much pain or sleeplessness — singly or combined, and in the various *neurotic affections*.

On account of the very sparing solubility of morphia in water, it is but seldom prescribed; although Bally, in opposition to many experimenters, asserts, that he has found it equally efficacious with its salts. As, however, this result is doubtless owing to the existence of acid in the stomach, and, consequently, is liable to uncertainty, it is advisable to give the salts of morphia the preference, which are administered in nearly the same doses as pure morphia itself.

METHOD OF ADMINISTERING.

Pure morphia is only given internally in the form of powder or of pill, beginning with from one-sixteenth to one-fourth of a grain once or twice a day, and gradually increasing the dose to a grain and a half. If its use have been discontinued for some days, the dose, when resumed, must be again small, and be gradually increased.

Haustus morphiæ.

Draught of morphia.

(*Potio Narcotica.*)

R. Morphæ, gr. $\frac{1}{4}$.
Aq. destillat. f. ʒj .
Syrup. papav. f. ʒj . M.

To be taken at bed-time.

* Die neuern Arzneimittel, u. s. w. S. 327.

Enema morphiæ.

*Injection of morphia.**(Injectio leniens.)*

R. Ol. amygdal.
 Ol. lilior. āā. ℥ss.
 Morphicæ, gr. ij.

To allay *pain in the ear*, the suffering in *acute blennorrhagia*,
 and the *tenesmus in hemorrhoids*, &c. BRERA.*

Linimentum morphicæ.

Liniment of morphia.

R. Morphicæ, gr. iiij.

Solve in

Ol. amygdal. ℥i.—℥iss.

To be rubbed on the neighbourhood of the eye, as an anodyne,
 in cases of *cancerous* and other *painful affections of the eye*.
 A. Poli.†

CI. MORPHIÆ ACETAS.

SYNONYMES. Morphicæ Acetas, Morphiū Aceticum, Acetas Morphii, Acetas
 Morphicus, Acetate of Morphia.

French. Acétate de Morphine.

German. Essigsäures Morphin, Morphiūacetat.

METHOD OF PREPARING.

Acetate of morphia may be obtained by mixing *morphia*,
acetic acid and *distilled water* in an appropriate vessel, and
 gradually evaporating to dryness, at a temperature of about
 90° Fahr.‡ This mode of preparation is required, owing to the

* Ricettario Clinico. Padova, 1825.

† C. G. Lincke, Vollständiges Recept-Taschenbuch, u. s. w. ii. 288.
 Leipz. 1841.

‡ Pharmacop. of the United States, p. 144, Phil. 1842.

difficulty of obtaining the acetate crystallised, in consequence of its extreme deliquescence. Crystallised acetate of morphia may, however, be prepared by dissolving *morphia* in *alcohol*, saturating with *acetic acid*, filtering the solution, and evaporating gradually in a vessel covered over with thin rag. The acetate crystallises in an arborescent manner on the sides of the vessel.

Acetate of morphia is one of the substances, which, in the experiments of Magendie,* were found to promote the coagulation of the blood.

Of late, this salt of morphia has been highly recommended in *arthritis* and *nervous affections*, by M. V. Cristin,† of the Hospital St. John, Turin, according to a form given below. When the pains are relieved, or sleep is about to commence, the intervals between the doses are increased, or it is suspended altogether. Its good effects in *neuralgia* have been extolled by many others; — the effect of the remedy being kept up for days and weeks, if necessary. Mr. Braithwaite‡ remarks, that Dr. Cristin prescribes it in the dose of one-tenth of a grain every hour, but that he has generally found it necessary to give much larger doses without any other bad effect than severe sickness, which was easily abated by creasote or excitants — as the *spiritus ammoniæ aromaticus*. He prescribes one-fourth or one-sixth of a grain every hour or two, in severe cases, until the system is completely under its influence, and then keeps up its effects by smaller, and less frequently repeated, doses. It is questionable, however, whether the acetate be superior to opium.

Dr. Francis Gérard, of Avignon, has found the acetate so highly useful in *Asiatic cholera*, that he prefers it to all other remedies. Of ninety-nine patients, treated thereby, eighty-one were cured. He found, when given early, that it especially checked the vomiting, and moderated the subsequent reaction, after which the other symptoms gradually ceased. When, however, the resources of art had been long postponed, the effects of the remedy were less marked; the vomiting and the other symptoms persisted longer; the supervening reaction was much more tardy, and frequently ended in a state of collapse, which, under the most trifling imprudence, produced an unfortunate result. Gérard administered the acetate at first in the dose of one-fourth of a grain every half hour, until the serious symptoms were

* *Leçons sur le Sang*, &c., and translation, in *London Lancet*, Jan. 26, 1839, p. 636.

† *Repertorio Medico-chirurgico del Piemonte*, cited in *British and Foreign Medical Review*, Jan. 1840, p. 252.

‡ *Retrospect of Practical Medicine and Surgery*, vol. i. Jan. to July, 1840, 3d edit. p. 15. Lond. 1842.

removed, and he omitted it as soon as the spasms and the diarrhœa and vomiting had ceased, or as soon as reaction ensued.

Acetate of morphia has been much used *endermically* in the diseases mentioned under the head of MORPHIA. A quarter or half a grain or more is placed on some part of the skin whence the cuticle has been removed; and it may be repeated, as the case may require. In the severer *neuralgic* and *neurotic* cases, the quantity applied in this way is sometimes very large. In a case of *hydrophobia*, reported by Dr. Burne,* of London, ten grains at a time were sprinkled on a blistered surface with excellent tranquillising effects. At times, when applied to a blistered surface for several days in succession, a papular eruption has been observed, which quickly becomes vesicular, proceeding from the edges of the blister, and gradually spreading over the entire surface.†

A case of *traumatic tetanus* has been published, which was cured by the internal and endermic use of the acetate of morphia.‡

It has been likewise proposed to *inoculate with morphia*. If the point of a lancet, dipped in an aqueous solution of morphia, be inserted horizontally about one line in depth beneath the epidermis, and be allowed to remain there a few seconds, the following effects, according to M. Lafargue, are observed:—About a minute and a half after the operation, a small pimple appears, with a diffuse rosy areola, and slightly itching: in about twenty minutes, the pimple becomes about four lines in diameter, and one line in thickness, and is flattened: its colour is somewhat deeper than that of the skin; it is hard; the areola very red, and about an inch and a half in diameter; its heat is increased, but the sensation of itching remains about the same. During the first hour, the pimple and its areola are at their highest degree of development, after which they gradually disappear.

The general effects, which M. Lafargue experienced from thirteen punctures thus made on the anterior part of his forearm, were,—heaviness of the head, frequent yawnings, clamminess of the mouth, and an invincible desire to sleep; yet the quantity of muriate of morphia employed could not have exceeded a quarter of a grain. He considers, that the inoculation of morphia may supersede the use of blisters and ammoniacal plasters, and that it deserves employment more particularly where the object of the physician is to produce the local effects of morphia. Its influence as a rubefacient are marked, and hence its probable utility in *superficial neuralgia* and in *chronic rheumatism*.§

* Lond. Med. Gaz. April 14, 1838.

† Dr. A. Thomson, in London Lancet, for Jan. 19, 1839, p. 632.

‡ L. Piquot. Journ. des Connais. Méd. Chirurg. Dec. 1840.

§ Q. Gibbon, Duglison's Amer. Med. Intelligencer, July, 1841, p. 1.

The experiments of Lafargue were repeated by M. Martin-Solon, with nearly the same results.*

METHOD OF ADMINISTERING.

The dose of this article is from a quarter of a grain and less, to a grain or more. Its strength does not vary materially from that of pure morphia.

Liquor morphiæ acetatis.

Solution of acetate of morphia.

R. Acetat. morphiæ, gr. xvj.
Aquæ destillat. f.ʒvj.
Acid. acetic. f.ʒij. M.

This formula was proposed by the author† as a substitute for the “*gouttes calmantes*” of Magendie,‡ which permit the deposition of the morphia when kept for a short time. The dose is from six to twenty-four drops.

R. Morphiæ acetat. gr. xvj.
Aquæ destillat. f.ʒj.
Acid. acetic. gtt. iij. vel iv.
Alcohol. f.ʒj. Fiat solutio.

Magendie.

Mistura morphiæ acetatis.

Mixture of acetate of morphia.

R. Acetat. morphiæ, gr. i.
Aquæ destillat. f.ʒiv.
Syrup. acaciæ, f.ʒi. M.

Dose. — A spoonful every hour in *arthritis* and *nervous affections*, until the pains are removed. *Cristin.*

* Bulletin de l'Académie Royale de Médecine, Nos. 1 & 7, 1836-7.

† Formulary, &c., translated from Magendie, by C. T. Haden, Esq. 2d edit. by Robley Dunglison, M.D. p. 14. Lond. 1824. Amer. edit. Philad. 1825.

‡ Formulaire, &c.

Syrupus morphiæ acetatis.*Syrup of acetate of morphia.*

R. Morphicæ acetatis, gr. iv.

Syrupi simplic. Oi.

Dissolve the salt in half a dram of water acidulated with a few drops of acetic acid; filter, and add it to the syrup.

This syrup is recommended and used in Paris, in place of the *syrupus papaveris*. It has the advantage of being always of uniform strength. *Magendie.*

It has been suggested,* that the syrup of the acetate or sulphate of morphia should always be made of the strength of one grain to the ounce; and it is certainly desirable that uniformity should prevail in this respect. If this exist, it matters but little what the proportion is, within certain limits.

The acetate may, also, be applied in the form of OINTMENT; and it is frequently added to glysters, in *chronic diarrhæa*. Hildenbrand recommends the following ointment to be rubbed on the pubes in *cancer of the uterus*:—

Unguentum morphiæ acetatis.*Ointment of acetate of morphia.*

R. Morphicæ acetat. gr. iv.

Ung. hydrarg. ciner.

———— simpl. āā. ℥ij.

A piece, the size of a pea, to be rubbed on twice daily.

A solution of acetate of morphia, which he terms *liquor opii*, has been proposed by Mr. Houlton.† He prepares it as follows:— Take two ounces and a half of the *best Turkey opium*; thirty-two fluid ounces of *Beaufoy's acid* of the strength of pickling vinegar: macerate with a gentle heat for six days, frequently shaking the vessel; then filter, and evaporate the fluid to the consistence of the extracts of the pharmacopœia, finishing the evaporation by the spontaneous method. This Mr. Houlton employs under the name *extractum opii aceticum*. To the above extract he

* A. Duhamel, Amer. Journ. of Pharmacy, for Oct. 1840, p. 187.

† Lond. Med. Gaz. Aug. 12, 1837. See, also, M. Buchner, père, in Journal de Pharmacie, Février, 1842, p. 48.

adds *alcohol*, five fluid ounces ; *distilled water*, thirty-five fluid ounces ; macerating for eight days, and filtering.

This *liquor opii* is about the strength of the *tinctura opii* in sedative property, and Mr. Houlton affirms, from his observations, that it is in no respect inferior to Battley's *liquor opii sedativus*, — a secret preparation, which has been much used.

CII. MORPHIÆ MURIAS.

SYNONYMES. *Morphinæ Murias*, *M. Hydrochloras*, *Morphiæ Hydrochloras*, *Morphium Muriaticum*, *Chlorhydras Morphicus*, *Hydrochloras Morphicus*, *Murias Morphii*, *Muriate of Morphia*, *Hydrochlorate of Morphia* or *Morphine*.
French. Hydrochlorate de Morphine.
German. Salzsaures Morphin, Hydrochlorsaures Morphin.

METHOD OF PREPARING.

According to the last Pharmacopœia of the United States, the muriate of morphia is prepared as follows : — Take of *Morphia*, in powder, ℥i. ; *Distilled water*, Oss. ; *Muriatic acid*, a sufficient quantity. Mix the morphia with the water, then carefully drop in the acid, constantly stirring till the morphia is saturated and dissolved. Evaporate the solution by means of a water bath, so that it may crystallize on cooling. Dry the crystals on bibulous paper.

In the London and Edinburgh Pharmacopœias, morphia is first separated from opium in the form of the muriate.*

Muriate of morphia is in snow-white feathery crystals, which are wholly soluble in water.

MODE OF ADMINISTERING.

It may be given in the same cases and doses as the other salts of morphia.

* For Dr. Wm. Gregory's mode of preparing the muriate, see *Edinb. Med. and Surg. Journ.* for April, 1831 ; *Amer. Journ.* for August, 1831, p. 531 ; and *Philad. Journal of Pharmacy*, iii. 124. See, also, Mr. M. Robertson, in *Edinb. Med. and Surg. Journ.* April, 1832 ; and Dr. A. T. Thomson, *Lond. Pharmaceut. Journ. and Transact.*, and *Amer. Journ. of Pharmacy*, July, 1842, p. 154.

The following preparations are directed in the Edinburgh Pharmacopœia:—

Trochisci morphiæ.

Morphia lozenges.

R. Morphię muriat. \mathfrak{J} i.
Tinct. tolut. f. \mathfrak{Z} ss.
Sacchar. \mathfrak{Z} xxv.

Dissolve the muriate of morphia in a little hot water; mix it and the tincture of tolu with the sugar; and with a sufficiency of mucilage form a proper mass for making lozenges; each of which should weigh about 15 grains.* Each lozenge contains about one-fourth of a grain of muriate of morphia. Dr. Pereirat states, that the morphia lozenges of the shops usually contain $\frac{1}{24}$ th of a grain of the muriate. It is a good mode of employing morphia with the view of allaying cough.

Trochisci morphiæ et ipecacuanhæ.

Morphia and ipecacuanha lozenges.

R. Morphię muriat. \mathfrak{J} i.
Ipecac. in pulv. subtil. \mathfrak{Z} i.
Tinct. tolut. f. \mathfrak{Z} ss.
Sacchar. \mathfrak{Z} xxv.

Proceed as for TROCHISCI MORPHIÆ.

Each lozenge contains about one-fourth of a grain of muriate of morphia, and one-thirteenth of a grain of ipecacuanha. They are used in the same cases as the last.

* Christison, Dispensatory, p. 643. Edinb. 1842.

† Elements of Mat. Med. and Therap. ii. 1782. Lond. 1842; or Amer. edit. by Dr. Carson, Philad. 1843.

CIII. MORPHIÆ SULPHAS.

SYNONYMES. Morphinæ Sulphas, Morphiū Sulphuricum, Sulphas Morphii,

Sulphas Morphicus, Sulphate of Morphia or of Morphine.

French. Sulfate de Morphine.

German. Schwefelsaures Morphin, Morphinsulphat.

METHOD OF PREPARING.

Morphia is dissolved in dilute *sulphuric acid*. The solution is then evaporated by heat, and suffered to crystallize, which it does in silken tufts, or snow-white feathery crystals, that are wholly soluble in water.

EFFECTS ON THE ECONOMY.

The general effects on the economy in health and disease resemble those of acetate of morphia, to which it is perhaps to be preferred on account of its greater uniformity. There is an advantage, however, in retaining both preparations in the materia medica, as when the system becomes accustomed to the one, the other may be substituted.

In his experiments on the blood, Magendie* found that the sulphate of morphia — unlike the acetate and the muriate — opposed the coagulation of that fluid.

A *syrupus morphiæ sulphatis*, a *liquor morphiæ sulphatis*, and an *unguentum morphiæ sulphatis* may be formed in the same manner as with acetate of morphia.

The common form for the solution of sulphate of morphia is the following: — it is that of the Pharmacopœia of the United States; and it is to be regretted, that the strength is not the same as that of the *Liquor Morphiæ Acetatis*.

*Liquor morphiæ sulphatis.**Solution of sulphate of morphia.*

R. Morphicæ sulph. gr. viii.

Aquæ destillat. Oss. Fiat solutio.

* Leçons sur Le Sang, &c.; or translation in London Lancet, January 26, 1839.

Dose. — A tea-spoonful (which is considered to be equivalent to about twelve or fourteen drops of laudanum), to be repeated as occasion may require.

CITRATE of MORPHIA is occasionally used ; but it possesses no advantage over the preparations described above.

Many years ago, Dr. Porter, of Bristol, recommended a *liquor morphiæ citratis* to be prepared in the following manner : — Beat four ounces of the best crude *opium* in a mortar, with two ounces of *crystallised citric acid* ; mix well with a pint of *boiling water* ; filter after twenty four hours' maceration. Dr. Paris speaks well of this preparation.* Magendie recommends the substitution of the following process :

R. Morphiæ pur. gr. xvi.
 Acid citric. crystalliz. gr. viij.
 Aquæ destillat. f.℥j.
 Tinct. coccinel. q. s. Fiat solutio.

Dose. — Six to twenty-four drops in the twenty-four hours.

A TARTRATE of MORPHIA was suggested by Mr. Haden† as a substitute for the *liquor opii sedativus*, of Battley. Mr. Haden made it by macerating the *dregs*, remaining after making the tincture of opium, in a solution of *tartaric acid*. Forty drops acted in all respects like twenty of the *liquor opii sedativus*. It neither stimulated nor induced costiveness.

Of late, the *bimeconate of morphia* has been brought before the notice of the profession by Mr. Squire,‡ but he has not given the formula for its preparation. Impressed with the idea, that the combination of the active principle of opium, as prepared by nature, would prove more beneficial as a therapeutical agent than the artificial salts, he instituted a number of experiments, with the view of procuring the bimeconate as free from the other ingredients of opium as possible ; and he asserts, that at length he obtained a tolerably pure salt, which, from the trials that have been made with it, has fully answered his expectations as to its superior medicinal power over the other preparations of

* Pharmacologia, 4th Amer. from 7th Lond. edit. By Dr. J. B. Beck, p. 439. New York, 1831.

† Translation of Magendie's Formulary, 2d edit. By Robley Dunglison, M. D. &c. p. 19. Lond. 1824.

‡ Lond. Med. Gazette, Mar. 9, 1839.

opium. The salt is given in solution made nearly of the same strength as laudanum.

Dr. Macleod, who made trial of it, asserts, that it appeared to him to be a very mild and efficient preparation, rarely producing headach or other discomfort; and that it repeatedly answered, in the most satisfactory manner, where opium had disagreed, and succeeded in some cases where other salts of morphia — the acetate and the muriate — had failed to give relief.

Equally strong testimony in its favour is afforded by Dr. A. T. Thomson, who details three cases — one of *neuralgic pain* of the left side of the face; another of *wakefulness*, without any apparent cause, and a third of *anomalous pain of the hip and thigh*, all benefited strikingly by its use.

A preparation termed *M. Munn's Elixir of Opium* has been recently introduced into American practice with many testimonials in its favour; but the formula for its preparation is kept secret; and, therefore, it merits no farther notice here.

CIV. MOXA.

SYNONYME. Moxiburium.

By the term *moxa*, the Chinese and Japanese designate a cottony substance, which they prepare by beating the dried leaves of *Artemisia Chinensis*, a kind of Mugwort. Dr. Lindley, however, states, that it is made from *A. Moxa*.* With this down they form a cone, which is placed upon the part intended to be cauterised, and is set fire to at the top.

This mode of exciting counter-irritation has been long practised by the Chinese and Japanese, and by the ruder nations of the old world; but it was not much employed in Great Britain and France until about the commencement of the seventeenth century, when it was introduced through the agency of a physician who had resided in India. It fell again, however, into disuse, until attention was redirected to it, during the last century, by Pouteau† and Dujardin, and, at the commencement of this century, by Percy and Laurent,§ and others.||

* Flor. Med. 463.

† Ten Rhyne, *Medit. de Veteri Medicin.*; *Dissert. de Arthritide*, Lugd. Bat. 1672; and Kämpfer's *History of Japan*, translated by Scheuchzer, vol. ii. append. sect. iv. Lond. 1728.

‡ *Mélanges de Chirurgie*, p. 49.

§ *Dictionnaire des Sciences Médicales*, Art. Moxibustion.

|| See, for a history of the moxa, the author's translation of Baron Larrey's *Memoir on the Use of the Moxa*. Lond. 1822.

MODE OF PREPARING.

Various agents have been used by different people, in “moxibustion,” — for so the mode of cauterisation has been termed, which consists in placing some combustible substance on a part of the body, and suffering it to burn down. From the earliest ages, the Nomades employed the fat wool of their flocks, as well as certain spongy substances growing upon oaks,* or springing from the hazel;† the Indian, the pith of the reed,‡ and flax or hemp impregnated with some combustible material;§ the Persian, the dung of the goat; the Armenian, the agaric of the oak; the Chinese and Japanese, the down of the artemisia; the Thessalian, dried moss;|| the Egyptians, the Arracanese, and several oriental nations, cotton;¶ the Ostiaks** and the Laplanders,†† the agaric of the birch; and the aborigines of this continent, rotten and dried wood. Hippocrates‡‡ was in the habit of employing fungi and flax for the same purpose.

In modern times, also, various substances have been used for the fabrication of moxas. Whatever article is selected, it ought to be a spongy, light, vegetable matter; readily combustible, and so prepared as to burn down slowly. In Germany, they use the tinder — *amadou* — which is known to be an agaric prepared for the purpose; and it is not uncommonly employed in our hospitals, — a small disc or cylinder being placed on the part, and set fire to. It is now generally used in the French Hospitals.§§ The match used by artilleryists was recommended by Percy,||| after Bontius:¶¶ it is composed of hemp steeped in a solution of nitre. He likewise proposed the pith of the sunflower — *helianthus annuus* — recommending, that the stalk should be cut into cylinders of the desired length, the bark being left on; so that, when ignited, it may burn in the centre and be held with the hand.*** This, he called *moxa de voleurs*.††† These moxas, called *Percy's moxas*, prepared by Robinet, are usually

* Hippoc. lib. de Affect. cap. xxx.

† Paulus Æginet. lib. vi. cap. 49.

‡ Kämpfer, vol. ii. app. sect. iv. p. 36.

§ Bontius de Medicinâ Indorum, p. 32.

|| Percy, in Pyrotechnie Chirurgicale pratique, p. 12.

¶ Prosper. Alpin. de Medicinâ Ægyptiorum, lib. iii. cap. 12.

** Voyages de M. Pallas, iv. 68.

†† Acerbi's Travels through Sweden, Finland, and Lapland, ii. 291; and Linnaeus, in Lachesis Lapponica, translated by Sir James Smith, i. 274.

‡‡ De Affect. cap. viii.

§§ Bulletin Général de Thérapeutique, Juillet, 1840.

||| Op. cit. p. 77. Paris, 1811.

¶¶ Op. cit. p. 32. Paris, 1645.

*** Art. Moxibustion, in Dict. des Sciences Médicales.

††† Mérat and De Lens, Dict. de Mat. Méd., Art. Moxa.

found in the London shops. They consist of pith, rolled in cotton and enveloped in muslin.*

The moxa, used by Larrey, and very generally employed by many practitioners, is made by taking a quantity of cotton wool, pressing it somewhat closely together, and rolling over it a piece of fine linen, which is fastened at the side by a few stitches. Larrey advises, that it should have the shape of a truncated cone — the form usually adopted — and be about an inch long. Commonly the cylinder is shorter than this; six or eight lines — as, when above six lines high, the combustion is not felt — and about four or five lines broad. The moxas, employed by Dr. Sadler,† of St. Petersburg, are about half an inch in diameter, and three-quarters of an inch in height. They are composed of a nucleus formed of the pith of the sunflower, wrapped in layers of cotton, of various thickness, and surrounded with an external envelope of thin muslin; both of the latter being previously steeped in a solution of nitre. They are held, while burning, by means of two long hair-pins, the legs of which are slightly bent, in order to accommodate them to the shape of the moxa; and, when the latter is burned down to the place where it is held by the first hair-pin, it can be held with the other, and retained in its proper position. With this last view, Larrey‡ has a special *porte-moxa*, consisting of a ring to receive the cylinder, with a handle attached to it, and three small supports or knobs of ebony, placed beneath the ring, to prevent the heated metal from acting upon the surface.

Mr. Leney§ soaks a piece of lint in a strong solution of nitrate of potassa, dries it, and cuts off pieces of the size of the thumb nail, which he fastens with thin adhesive plaster over the seat of pain; sets fire to the opposite extremity, and then applies the blow-pipe. The pain during the process is very severe, but he affirms, that the Irish prefer it greatly to the application of a blister.

Professor Gräfe|| employs moxas made of wafers, dipped in a mixture of three parts of oil of turpentine, and one part of sulphuric ether. Before applying this inflammable matter to the skin, it is necessary to carefully remove the superfluous liquid. These moxas are said to ignite readily, burn promptly and uniformly, and not to crepitate.

Of late years, a plan for raising vesication on the surface has

* Pereira, Elements of Mat. Med. 2d edit. p. 1352. Lond. 1842; or Amer. edit. by Dr. Carson, Philad. 1843.

† Zeitschrift für die gesammte Medicin. B. iii. H. ii. & iii. and British and Foreign Med. Review, July, 1837, p. 217.

‡ The Author's translation of his Essay on the Moxa, p. 5.

§ Lond. Med. Gaz. July 15, 1842.

|| La Lancette Française, Jan. 26, 1839.

been adopted, which, as Dr. Granville remarks, must be regarded as a kind of moxa.* This, he admits, is equally successful with the one he proposes, and which we have already described (p. 191), in forming a rapid vesication: "but it is, at the same time, so complicated, and attended by such intense pain," that, in practice, he says, it will not bear comparison with the preparations which he recommends. A piece of linen or paper, being cut of the requisite size, is immersed in spirit of wine, or brandy. It is then laid on the part to be blistered, care being taken, that the moisture from the paper or linen does not wet the surrounding surface. The flame of a lighted taper is applied quickly over the surface, so as to produce a general ignition, which is exceedingly rapid. At the conclusion of this operation, the cuticle is found detached from the true skin beneath. In cases of *convulsions*, the region of the spine has been treated in this manner, and with good effects.†

Dr. Osborne, of Dublin,‡ avails himself of the high temperature produced by lime in the act of slaking, for the purpose of a moxa. Some quicklime in powder is placed to the depth of about half an inch within a strip of card, bent and tied so as to form a circle. Some water is then dropped on the lime, and mixed with it. In about two minutes, it swells, and becomes dry; and, at the same time, a degree of heat is produced, which—according to some experiments—may amount to 500° Fah. Dr. Osborne considers this moxa superior to all others;—*first*, from the intensity of the heat, and *secondly*, from its convenience,—not requiring the assistance of any heated substance, and being unaccompanied by the emission of sparks or smoke, which frighten the patient. When the quantity of lime used is smaller than that mentioned above, or if it be not kept on long, an appearance results, resembling that produced by acetic acid; and a thick crust is formed, which separates as the new skin is perfected beneath. But if the quantity of lime be large, and it be kept on as long as the heat continues, a complete destruction of the skin ensues; and in this manner issues may be made of greater depth, and in a much shorter time, than by the usual cauterants.

Dr. Osborne gives a case of *apparent ulceration of the upper part of the rectum and sigmoid flexure of the colon*; in which all the symptoms of internal ulceration disappeared after the application of a lime moxa, of about the size of a crown, over the region of the sigmoid flexure. In a case of *incipient soften-*

* Counter-irritation, its Principles and Practice, Dunglison's Amer. Med. Library edit., p. 21 and p. 42. Philad. 1838.

† Mr. C. J. Edwards, in Provincial Medical and Surgical Journal, January, 1842.

‡ Dublin Journal of Med. Science, Jan. 1842.

ing of tubercles ; and in another apparently of *purulent infiltration after pneumonia*, its effect in arresting the ulcerative process was most decided. In a case of *hip-joint disease*, in which there was great pain, and consequent loss of sleep, the patient slept well on the following night, and, in a few days, had gained much power over the limb ; and in another case of the same disease, which had proceeded to destruction of the joint, and extensive enlargement of the parts around it, great relief was obtained.

The size of the ulcer formed by it is always much larger than that of the lime applied. When the lime is prepared from calcareous spar, the heat, produced on the addition of water, is sudden and intense, and the pain is proportionably urgent. For ordinary purposes, however, well selected pieces of lime from a lime-kiln answer well if fresh, but not otherwise.

In the application of the various moxas, or of most of them, their agency can be so graduated as to produce either simple rubefaction, vesication or the formation of an eschar. Where it is desirable to produce the first result only, the cylinder of cotton may be removed when the pain becomes somewhat severe ; or the burning material may be held close to the surface, and be moved gradually along it. In this manner, a counter-irritant effect may be exerted along the spine or any extensive surface. Any burning substance — a lighted coal, for example — will answer for this purpose. When vesication is needed, it must be kept on longer ; and if it be desirable to produce an eschar, the moxa may have to remain on until it is wholly consumed. Larrey,|| indeed, advises, that the blowpipe should be occasionally employed to hasten the combustion. When the integument has once become disorganized, the slough will be thrown off in due time, leaving an ulcer. Larrey says the sloughing can be prevented by the application of liquid ammoniac to the burnt surface, after the moxa has been removed. This will do when the disorganization is partial ; but we know, from experience, that it often fails.

EFFECTS ON THE ECONOMY IN DISEASE.

Moxa — in its different forms — is doubtless a most valuable agent, where rapid counter-irritation is indicated. It resembles, indeed, in its action, the ammoniated counter-irritants of which we have already treated, and is applicable to the same diseases ; — the only difference between them — when cauterisation is

* Op. citat. p. 5.

† Ibid. p. 9.

effected — being, that the agent in the case of the ammoniated lotion is a *potential*, in that of moxa an *actual*, cauterant.

The moxa must be regarded as one of our most valuable re-vellents.

CV. NARCOTINA.

SYNONYMES. Narcotinum, Narcotin, Narcotine, Opiane, Matter or Salt of Derosne.

French. Matière ou Sel de Derosne, Sel Essentiel d'Opium.

German. Narkotin, Opian, Derosne's Opiumsalz.

On this substance, which is one of the immediate principles of opium, and which has attracted the attention of many chemists and therapists, much uncertainty exists in regard to its precise properties. It seems, that it has not hitherto been found except in opium.

METHOD OF PREPARING.

It is commonly obtained, either from the *aqueous extract of opium*, by means of *ether*, which only dissolves the narcotina, and consequently requires but to be evaporated to obtain it; or from *crude opium*, which has been exhausted by *cold water*: it may hence be obtained from the residue after the preparation of the aqueous extract of opium of the shops.

With this view, the *opium* is twice treated with *boiling acetic acid* at 2° or 3°; it is precipitated by *ammonia*, and the washed precipitate is purified by treating it with *hot alcohol* at 40°, and a little *animal charcoal*; the liquid is then filtered, and the pure narcotina is precipitated on cooling.

It crystallises in very white needles; is devoid of taste and smell; fusible in the manner of resins, and very slightly soluble in water; soluble, with the aid of heat in alcohol, and in the volatile and fixed oils; very soluble in ether, which distinguishes it from morphia; very soluble also in cold acetic acid, whence it is precipitated on heating the solution — another mode of separating it from morphia — and soluble in dilute acids. It is coloured of a vivid red by nitric acid; and is analogous, in some respects, to the crystallisable resins or *sub-resins* of M. Bonastre.*

* Mérat and De Lens, Dict. de Mat. Méd. Art. Narcotine.

Narcotina is generally reckoned amongst the vegetable alkalis ; but by some it is considered to be neuter.* Dr. Christison† states, that “ opium contains no fewer than six crystalline active principles ;—morphia, codeia, and paramorphia, narcotin, narceïn and meconin, of which the first three are alkaline and the others neutral.”

Dr. O’Shaughnessy‡ prepares *muriate of narcotina* by taking of *Bengal opium*, two pounds ; *Alcohol*, 20 pounds. These are rubbed together in a large mortar, adding the spirit by degrees, until the opium is exhausted of its soluble parts. The solution is then decanted, and the insoluble part pressed. To the alcoholic solution as much *ammonia* is added as renders the liquid slightly turbid. Fifteen pounds of the alcohol are then distilled from a common alembic ; and the fluid in the still is drawn off, and set aside to cool. On cooling, a mass of coloured crystals is deposited, composed of narcotina, meconate of ammonia, and resin. This is washed with *water*, which dissolves the meconate of ammonia, and afterwards with a quart of *water* and a dram of *muriatic acid*, which dissolves the narcotina and leaves the resin. The solution is then filtered, and evaporated to dryness.

Muriate of narcotina, thus prepared, is a transparent resinous mass, of a rosy colour, and brittle vitreous texture. It is very soluble in distilled water and spirits ; and its salts are intensely bitter.

EFFECTS ON THE ECONOMY IN HEALTH.

These have been so contradictory, that it has been conceived the same preparations cannot have been used by different observers.§

According to Magendie,|| morphia is the anodyne principle of opium, and narcotina the exciting. When a grain of narcotina dissolved in oil was given to a dog, it produced a state of stupor, which superficial observers might readily confound with sleep ; but it differed evidently from sleep ; the animal’s eyes were open ; the respiration was not deep as in sleep, and it was impossible to arouse it from its sluggish condition. Death generally took place in twenty-four hours. When combined with acetic acid, it produced quite different effects. Animals could bear a dose of even

* Christison, Dispensatory, p. 672, Edinb. 1842.

† Ibid, p. 671.

‡ Calcutta Quarterly Journal, and Lond. Lancet, July 20, 1839, p. 606.

§ Ibid. and Dict. des Sciences Médicales, xxxiv. 298.

|| Formulaire pour la Préparation, &c. de plusieurs nouveaux Médicaments.

twenty-four grains without dying, and whilst under its influence, they were agitated by convulsions like those which camphor induces — exhibiting the same signs of fright, the same backward motions, foaming at the mouth, convulsions of the jaws, &c. When morphia and narcotina were both given at the same time, the different effects of each occurred together. A grain of morphia, for example, and a grain of narcotina, dissolved in acetic acid, were placed in the pleura of a dog. The animal soon became drowsy and fell asleep under the influence of the morphia; but a singular and remarkable strife appeared to go on for an hour and a half, between the stimulating effects of the narcotina and the anodyne effects of the morphia. At length, however, the animal slept soundly, being probably, Magendie suggests, under the influence of the morphia alone. His opinion is, that narcotina is injurious when not united with an acid, and very exciting when so united.

M. Orfila — the celebrated toxicologist — it appears, has entertained various views upon the action of narcotina; at one time considering it inert, at another to possess the same action as morphia; and at another, to concur, when combined with morphia, in the properties of opium, but to a slight degree — since opium, deprived of narcotina, is not less deleterious — and to possess a different *modus operandi* from opium, without, however, our being able to regard it as the exciting principle.*

Owing to all these uncertainties connected with it, narcotina is little if at all employed in medicine. It would seem, however, that the exciting properties of opium do not appertain exclusively to it; for, as has been elsewhere remarked, there are many persons, who are as disagreeably affected by morphia alone as they are by opium which contains both morphia and narcotina.

The salts of narcotina have been employed successfully as an antiperiodic, especially in *intermittents*,† and Dr. O'Shaughnessy‡ has laid before the Medical Society of Calcutta, the results of his experience with them. Sixty cases were treated, of which all but two were successful. Dr. O'Shaughnessy remarks farther, that, besides the sixty cases recorded, more than one hundred ague patients had been treated by his pupils and acquaintances with perfect success by the remedy.

* Mérat and De Lens, *Op. cit.*, and Orfila, *Toxicologie Générale*, ii. 69.

† Dr. Roots, *London Lancet*, Sep. 1832, and T. W. Jeston, *Ibid.* Oct. 6, 1832, p. 41.

‡ *India Journal of Medical Science*, Sep. and Nov. 1838, and *British and Foreign Medical Review*, No. xv. for July, 1839, p. 263.

CVI. NUX VOMICA.

SYNONYMES. Vomic Nut, Poison Nut, Bachelor's Buttons.

French. Noix Vomique.

German. Krähenaugen.

EXTRACTUM NUCIS VOMICÆ ALCOHOLICUM.

SYNONYMES. Extractum Nucis Vomicæ Resinosum, E. Nucis Vomicæ Resinosum. Spirituous, Resinous or Alcoholic Extract of Nux Vomica.

French. Extrait Alcoolique de Noix Vomique.

German. Geistiges Extrakt der Krähenaugen.

In the year 1809, Magendie discovered, that one entire class of vegetables — the bitter strychnos — has the power of exciting the spinal marrow, without implicating, except indirectly, the functions of the brain.* Since then, many have confirmed the observations of Magendie, and have attended especially to its agency in various diseases. The preparation of the strychnos, most used — if we except the active principle — has been the alcoholic extract of the nux vomica.

METHOD OF PREPARING.

Take any quantity of *rasped nux vomica* ; exhaust it by repeated macerations in *alcohol* of 40° (.817), and evaporate it slowly to the consistence of an extract. Alcohol of less strength may be used, but, according to Magendie, the product will be proportionably less active. A dried alcoholic extract is made by dissolving in water the alcoholic extract made by means of alcohol at 36° (.837) ; filtering and evaporating in appropriate dishes, as in making the dry extract of bark.

The EXTRACTUM NUCIS VOMICÆ of the Pharmacopœia of the United States is directed to be prepared as follows : — Take of *Nux vomica*, a pound ; *Alcohol*, a sufficient quantity. Expose the nux vomica to steam till it is softened, then, having sliced and dried it, grind into powder. Introduce it into an apparatus for displacement, and pour alcohol upon it gradually until the liquid passes without bitterness. Distil off the greater part of the alcohol from the filtered liquor, and evaporate the residue to the proper consistence.†

* Examen de l'action de quelques végétaux sur la moëlle épinière. Paris, 1809 ; and Formulaire, &c.

† Pharmacopœia of the United States, p. 352, Philad. 1842.

EFFECTS ON THE ECONOMY.

According to Magendie, a grain of this extract, absorbed from any part of the body, or mixed with food, promptly destroys a dog of considerable size, by inducing paroxysms of tetanus, which, by their continuance, arrest respiration sufficiently long to induce complete asphyxia. When the dose is much stronger, the animal appears to die entirely from the action of the nux vomica on the nervous system.*

If an animal be touched whilst under the action of the substance, it experiences a commotion similar to that of a strong electric shock, and this takes place each time the contact is renewed. On dissection, no morbid appearances exist which can account for death.

When introduced into the frog's stomach, Dr. Lombard,† of Geneva, found, that it produced tetanic convulsions, which, in a few hours, caused death. The contractions of the heart were sometimes strong and complete, sometimes irregular, tumultuous, and intermitting; always diminished in frequency. Applied to the heart itself, it slightly stimulated it, rendering the pulsations more energetic and frequent, whence Dr. Lombard concludes, that the nux vomica cannot be used with advantage in any diseases of the heart; for, although it diminishes the frequency of the pulsations, it renders them irregular.

The action of the extract on healthy man is the same as that described by Magendie, and if the dose be sufficiently large, death speedily follows with the same symptoms.‡ In those that are affected with paralysis, the effect is also the same; but what is singular, it is particularly manifested on the paralysed parts by tetanic convulsions, and a feeling of creeping, which indicate the operation of the remedy: a local perspiration is also often observed to break out on some parts of the body. When administered in cases of hemiplegia, the contrast between the two sides of the body is rendered striking: whilst the sound side remains at rest, the other may be violently agitated; tetanic shocks may supervene and a copious perspiration break out. In a female, Magendie saw the affected side covered by a peculiar eruption, whilst the other side afforded no trace of it. There is a difference even between the two sides of the tongue, a decidedly bitter taste being occasionally perceived on the one, whilst the other exhibits nothing similar.

* Ségalas, in *Journal de Physiologie*, par Magendie, Oct. 1822.

† *Gazette Médicale de Paris*, Oct. 10, 1835.

‡ See the details of two cases of poisoning by nux vomica, in *Lond. Med. Rep.* xix. 448 and 456; Christison on Poisons, and Brande, *Dictionary of Materia Medica*, p. 375. Lond. 1839.

If a much larger dose be given, both sides of the body participate, but unequally, in the tetanic spasms, so that the patient is sometimes thrown out of bed by the violence of the contractions. When given in very small doses, it has not any perceptible effects immediately, and some days elapse before its advantageous or noxious properties can be appreciated.

According to Magendie,* the extract may be given in all *diseases that are attended with debility*, general or local, and in *paralysis of all kinds*, general or partial. He himself observed excellent effects from it in marked cases of *debility of the genital organs, incontinence of urine, &c.* He also used it with advantage in several cases of *partial atrophy of the upper and lower extremities*. As regards its administration in cases of *paralysis succeeding to apoplexy*, he remarks, that it should not be given until some time after the *coup de sang* in the brain, which occasioned the palsy; and that even then beneficial results can be expected only when no marked organic mischief exists; indeed, in the latter case, he considers the disease irremediable, and that bad effects might result from pushing the remedy.

The efficacy of the alcoholic extract of nux vomica in various forms of *paralysis* has been confirmed by many observers. Even before Magendie had employed it, Fouquier,† had given it in several cases, with the most satisfactory results. Since then, we have had the testimonies of Chauffart,‡ Gendron,§ Perrussel, Récamier, Mauricet, Baxter,|| Galli, Hauff, Wenneis, Burkard, Pérequin,¶ Gellie,** and numerous others in its favour.

The Author's own experience with it in cases of *hemiplegia* has not been limited; yet although he has succeeded in inducing tetanic movements in the limb, he has not been satisfied that much advantage was derived from it;†† and, in some cases, it appeared to induce serious encephalic excitement. After effusion has occurred into the encephalon time is required for its absorption, and but little beneficial agency can be expected from any remedy. Nor are the results of the experiments and observations of Jahn by any means in accordance with those of the practitioners above mentioned. He tried it in numerous cases of

* Formulaire pour la Préparation, &c. de plusieurs nouveaux Médicaments, &c.

† Bulletin de la Faculté de Médecine, &c. vol. v. 1818.

‡ Journ. Génér. de Méd. Oct. 1824.

§ Ibid. Nov. 1829.

|| New York Medical Repos. vol. viii.

¶ Gazette Médicale de Paris, Oct. 27, and Nov. 3, 1838, and Bulletin Général de Thérapeutique, Mars, 1840.

** La Lancette Française, Août 29, 1837.

†† See the Author's Practice of Medicine, ii. 262. Philad. 1842. Also Chauffart, in Op. cit.

paralysis, but affirms, that he did not see any good effect from it; and, with the exception of two cases, did not notice the slightest action, although the extract was carefully prepared according to the formula given by Magendie. Yet, he remarks, he was by no means sparing in the dose. In the two cases in which a change seemed to be induced, there was an evident increase of the paralysis.

This discrepancy, as well as other evidences of the same contrariety of experience, may doubtless have been partly owing to difference in the strength and quality of the preparation; and hence, according to some, the value of strychnia — its active principle — which is not liable to as much uncertainty.* Dr. Christison,† however, affirms, that “there seems no particular reason why the powder and extract should have been displaced by the principle strychnia; for their effects are precisely the same; and the principle is not only troublesome to prepare, but likewise, being seldom pure, is liable to the objection of irregular strength, which is brought against the galenical preparations of the drug.”

In cases of *partial paralysis*, as in *colica pictonum*, *amaurosis*,‡ *palsy of the rectum*, &c., both the alcoholic extract of nux vomica and its active principle have been used and with good effect. (See STRYCHNIA.)

Dr. Cerchiarì§ treated two cases of *incontinence of urine* successfully with the extract. The first was that of a girl nineteen years of age — who, from her infancy, had passed her urine involuntarily every night in her sleep. She was ordered the third of a grain of the extract in pill, three times a day; and in eight days the cure was complete. The second case was that of a young married female, whose urine flowed involuntarily, day and night, after her first delivery. As there was no fistulous opening to account for the involuntary discharge, and it appeared to arise from weakness of the neck of the bladder, in consequence of contusion by the head of the child, the extract was administered in the same doses as in the preceding case, and in fifteen days the cure was complete. Mondière, in cases of incontinence of urine dependent upon atony, prescribed it advantageously in association with black oxide of iron.||

M. Pétrequin¶ found, that *local anæsthesia* or *loss of sensibi-*

* Richter's *Specielle Therapie*, u. s. w. B. x. S. 352. Berlin, 1828.

† Dispensatory, p. 658. Edinb. 1842.

‡ Pétrequin and Miquel, in *Bulletin Général de Thérapeutique*, Juillet, 1838.

§ *Gazette Médicale*, Avril 14, 1838.

|| A. Bouchardat, *Annuaire de Thérap.* pour 1841, p. 8. Paris, 1841.

¶ *Bulletin Général de Thérapeutique*, Mars, 1840.

lity in a part yielded, in numerous instances, to embrocations of the tincture referred to hereafter.

Cazenave gave the extract successfully in a case of *St. Vitus's dance*, which had resisted every other remedy. Sir Charles Scudamore and Mr. Pidduck* found it useful in *neuralgia*, the former especially in *neuralgia faciei*. Vogt gave it — not without advantage — in *cardialgia*; Hildenbrand in *epilepsy*: by the Russian and Polish physicians it was administered advantageously in *choleric diarrhœa*, and by many it has been strongly advised in *chronic diarrhœa* and *dysentery*,† as well as in *dyspepsia*, in the varieties termed *pyrosis* and *gastrodynia*, especially when they appeared to proceed from *morbid irritability of the nerves of the stomach*,‡ as in the *vomiting of the pregnant female*.§ (See the article STRYCHNIA.)

MODE OF ADMINISTERING.

The best form for exhibiting the alcoholic extract of *nux vomica*, according to Magendie, is in pill, when we are desirous of inducing the tetanic convulsions. Each pill may contain a grain. One or two pills may be given at first, and the dose be daily augmented until the required effect is induced. It may then be discontinued to avoid accidents. It is better, he thinks, to give the pills in the evening, as night is the most favourable time for observing the phenomena we are desirous of inducing. It is sometimes necessary to increase the dose to twenty or thirty grains, before the tetanic effects supervene, but commonly from four to six grains are sufficient. Esquirol saw two cases, in one of which death took place after eighteen grains; in the other, after five: the stomach and bowels were found inflamed. Dr. Elliotson began with half a grain of a well prepared extract, and increased the dose every day, or every other day, by a quarter of a grain; but none of the patients bore a greater quantity than seven grains, and few more than four.

If from any cause the administration of the remedy has been

* Lond. Med. Gazette, Aug 7, 1840.

† Most's Encyclopädie, 2te Auflage, Art. Dysenteria, i. 573. Leipz. 1836. Geddings, N. American Archives, No. 2, Nov. 1834. Roots, in St. Thomas's Hospital Reports, No. iii. for April, 1836; and Hufeland, in Bally, Bulletin Général de Thérapeutique. Fvriér, 1838.

‡ Mellor, in Med. Gaz., Mar. 4, 1837, p. 850. Dr. H. S. Melcombe, *ibid.* Mar. 25, 1837, p. 964; and Dunglison's American Medical Intell. July 1, 1837, p. 124. Dr. M. Huss, in Zeitschrift für die gesammte Medicin. May, 1837, 393, and Amer Med. Intell. Aug. 1, p. 162.

§ Krogher, in Annuaire de Thérapeutique, pour 1842, par A. Bouchardat, p. 39. Paris, 1842.

interrupted for some days, it is necessary to recommence with the small doses, and to increase them again gradually as before.

When it is desirable to produce only the slow effects of the remedy, a grain or half a grain daily is sufficient. M. Pétrequin* begins with one-eighth of a grain for a dose, and gradually increases it to two, three, and even five grains in the course of the day.

Magendie directs a tincture to be made from the extract—the *Tinctura Nucis Vomiceæ*, *T. Strychnos*, *T. Nucum Vomicarum*, which has been introduced into some of the pharmacopœias. It is made by taking three grains of *dried alcoholic extract of nux vomica*, and dissolving it in an ounce of *alcohol* at 36° (.837). It is given by drops, and in mixtures, in those cases, in which the alcoholic extract itself is indicated.

M. Pétrequin† also employs a tincture of *nux vomica*, which he prepares with four ounces of the *powder* and a quart of *brandy*. This is used altogether externally as an embrocation to, and around, palsied parts.

Tinctura nucis vomiceæ composita.

Compound tincture of nux vomica.

R. Extract. nuc. vomic. alcohol. gr. xxiv.
Camphoræ, ℥j.
Tinct. pyrethri. f.℥j. M.

Dose. — Twenty drops, four times a day, with *arnica tea*, in cases of *paralysis*. Vogt.

R. Tinct. nucis vomiceæ,
—— cantharid.
Naph. phosphorat.‡ ℥ij. M.

Dose. — Thirty drops, three or four times a day, with *arnica tea*, in the *paralysis of torpid subjects*. Vogt.

Mistura nucis vomiceæ.

Mixture of nux vomica.

R. Extract. nuc. vomic. alcohol. gr. ij.—iv.—vj.
Aquæ melissæ, f.℥vj.
Mucilag. acac. f.℥ss. M.

* Op. cit.

† Op. citat.

‡ *Naphtha phosphorata*, *Æther sulphuricus phosphoratus*, is made by dissolving twenty-eight grains of *phosphorus* in four ounces of *rectified ether*.

Dose. — Two spoonfuls, every two hours, in *epilepsy*.
Hildenbrand.

A similar form is recommended by Richter* in *dysentery*. Two table-spoonfuls every two hours.

R. Tinct. nucis vomicæ, gtt. ij.
Aquæ lauroceras, ℥j. M.

Dose. — Ten drops every morning and evening, in the *vomiting of pregnancy*.
Kroyher.

Pilulæ nucis vomicæ.

Pills of nux vomica.

R. Ext. nuc. vomic. alcohol. ℥j.
Ext. glycyrrhiz. ℥vij.

Misce et fiat pilulæ lxxx.

Dose. — Two to six, two or three times a day, in *paralysis*.

Pilulæ nucis vomicæ ferruginosæ.

Ferruginous pills of nux vomica.

R. Extract. nucis vomic. alcohol. gr. vj.
Ferri oxid. nigr. ℥j. M.
et divide in pil. xxiv.

Dose. — Three, daily, in *incontinence of urine dependent upon atony*.
Mondière.

Pulveres nucis vomicæ.

Powders of nux vomica.

R. Bismuth. sub-nitrat.
Ext. nucis vomicæ alcohol. āā. gr. ss.
Magnes. carbonat. gr. iij.
Sacch. gr. xv.
Ol. menth. pip. gtt. ij.

Misce, et fiat pulvis.

Dose. — One, every three hours, in *cramp of the stomach*.
Vogt.

* Die specielle Therapie, ii. 133. Berl. 1821. See, also, Joy, in Tweedie's Library of Medicine, v. 296, Lond. 1810; or 2d Amer. edit. Philad. 1842.

R. Acaciæ,

Sacchar. ââ. gr. xij.

Nucis vomic pulv. gr. iij. M. et fiat pulvis.

Dose. — One of these powders to be repeated according to circumstances in the twenty-four hours, in *diarrhœa* and *dysentery*.
Hufeland.

Embrocatio nucis vomicæ.

Embrocation of nux vomica.

R. Tinct. nucis vomicæ, f. ʒj.

Liquor. ammon. caust. f. ʒij. M.

To be rubbed on the *paralysed limbs*, and on the surface, in *cholera*. See STRYCHNIA, and its preparations.

CVII. O'LEUM JEC'ORIS ASEL'LI.

SYNONYMES. Oleum Morrhuæ, O. Jecinoris Aselli, Codliver Oil, Cod Oil.

French. Huile de Morue, Huile de Foie de Poisson.

German. Stockfischleberthran, Berger Thran, Gichtthran, Leberthran, Kabbiauthran.

The animal fat, which appears under this name in commerce, is obtained from several of the fishes belonging to the genus *Gadus*, order *Malacopterygii thoracici*, but especially from the codfish (*Gadus morrhua*); the Torsk (*Gadus callarias*); the Coalfish (*Gadus Carbonarius*), and the Burbot (*Gadus lota*).

At Anvers, it is said by M. Gouzee* to be prepared from the liver of a species of Ray — the *Raja Pastinaca*, and of the Skate.

Several varieties of the oil are met with in commerce, which differ from each other by their brighter or darker hue, and by their greater or less transparency. The clearest sort is admitted into the shops of continental Europe, especially, under the name *Oleum jecoris aselli album seu depuratum*: as a remedial agent it is more used than the darker variety, although several physicians affirm, that they have found the latter more efficacious.†

It would seem that only one variety is to be met with in com-

* Bullet. Méd. Belge, Janvier, 1838.

† See M. Taufflied, in Gazette Médicale de Paris, Août 12, 1837.

merce, either in London or this country. It is probably the second, and is used by curriers for dressing leather.

METHOD OF PREPARING.

According to Riecke,* the oil is obtained by exposing to the sun the livers of the fishes above mentioned, cut in slices, and collecting the fixed oil that runs out. That which is first obtained resembles fine olive or poppy oil, and is called "yellow codliver oil" — *Oleum jecoris aselli flavum* (German. *Helblanker Leberthran*). If the livers are running gradually to putrefaction, the oil becomes of a chestnut-brown colour — *Oleum jecoris aselli subfuscoflavum* — (German. *Braunkblanker Thran*); and, again, after the oil has been obtained by the above methods, some can still be procured by boiling the livers, which constitutes the *Oleum jecoris aselli fuscum*.†

At Newhaven, near Edinburgh, the fishermen simply boil the livers in an iron pot, and then filter the oil through a towel containing a little sand.‡

Mr. Donovan§ recommends the following process. Take any quantity of *livers of cod*; throw them into a very clean iron pot; and place it on a slow fire; stir them continually until they break down into a kind of pulp: water and oil will have separated. When a thermometer plunged in the pulp shall have risen to 192°, the pot should be taken from the fire, its contents transferred to a canvas bag, and a vessel placed underneath. Oil and some water will run through: after twenty-four hours, separate the former by decantation, and filter through paper.

The properties of codliver oil are said to be different in the different varieties met with in commerce. The colour varies from a bright yellow to a reddish-brown; and the oil is sometimes clear, but, at others, more or less turbid. The bright has the consistence of poppy oil; the brown is thicker. The smell is weaker in the former; in the latter, it resembles that of old salt herrings. The taste of the brown is an empyreumatic bitter; and resembles train oil; is somewhat acrid, and remains for a time on the tongue; that of the clearer oil is much less disagreeable. Litmus paper is feebly reddened by the clear,

* Die neuern Arzneimittel, u. s. w. S. 351, and 2te Auflage, S. 538. Stuttgart, 1840.

† For the analysis of the yellow and brown varieties, by Marder, see Riecke, Die neuern arzneimittel, u. s. w. 2te Auflage, S. 541, Stuttgart, 1840; or Pereira, Op. cit. p. 1865.

‡ J. H. Bennett, cited by Pereira, Elements of Mat. Med. and Therap. ii. 1866; or Amer. edit. by Dr. Carson. Philad. 1843.

§ Dublin Journal of Medical Sciences, July, 1840, p. 363.

considerably so by the brown variety. Both sorts are soluble in alcohol and ether.

According to Messrs. Gouzee and Gmelin the brightest oil ought to be employed internally; but MM. Trousseau and Pidoux* think that the limpid oil has no medical virtue. They prefer either the second, or that which is obtained by ebullition, and has a disagreeable acrid taste. Such, too, appears to be the opinion of Richter,† Delcourt‡ and others.

EFFECTS ON THE ECONOMY.

The oil, prepared by Mr. Donovan's process, is of a pale yellow colour; its smell is weak, and resembles that of a cod boiled for the table when in excellent condition. Its taste is bland, by no means disagreeable, and totally devoid of rancidity. It is very liquid. Its specific gravity, in Mr. Donovan's trials, was 0.934, although in all the published tables of specific gravities it is stated to be 0.923.§ In cold weather, it deposits much stearine, which ought not to be separated.

Mr. Donovan has obtained as much as a gallon of pure oil from twenty-eight pounds of livers, the produce of fifty cods; and he concludes, that in preparing codliver oil for medical purposes, three great points are to be attended to — 1. The livers must be perfectly healthy; 2. They must be as fresh as possible, the least putrescency being injurious; and 3. The heat at which the separation of the oil is effected must not exceed 192°.

Codliver oil has long been used as a popular remedy in northern Germany, especially in Westphalia — as well as in Holland and England; but it is only of comparatively late years that it has attracted the attention of physicians. In England, it appears to have been first recommended by Percival,|| and in Germany by Schenck.¶ When administered internally, it excites a disagreeable taste in the mouth, and nausea. Yet patients soon become accustomed to it; and Riecke** affirms, that he has frequently seen children take it without repugnance. When the nausea is once overcome, the oil does not oppress the stomach, except when it is *embarrassed*, or the digestive powers are greatly enfeebled. Nor does it seem to destroy the appetite

* *Traité de Thérapeutique, &c.*, 2de partie, p. 111.

† *Medicinisch. Zeitung*, No. 26, Juillet, 1835.

‡ *Bulletin Médical Belge*, Juin, 1841, p. 249.

§ Donovan, *Op. cit.*

|| *Essays, Medical, Philosophical and Experimental*, Warrington, 1790. vol. 2.

¶ *Hufeland's Journal*, 1822 and 1826.

** *Op. cit.*

by continued use. Yet many persons, especially adults — less so children — according to Kopp, reject it immediately. It is necessary for the digestive powers to be energetic when it has to be given for any length of time. To those, whose digestive organs are very irritable, Kopp recommends that Bourdeaux wine should be taken after it.

Codliver oil has no manifest effect on any of the secretions, except occasionally on the urinary and cutaneous depurations; and on the healthy organism it appears to excite no marked change. In *strumous affections*, however, its favourable influence is said to be striking, as well as in *rachitic, rheumatic, and gouty disorders*. In such cases, it is said, by the German writers, to excite powerfully the reproductive or nutritive functions, when administered for a proper length of time.* The favourable effects are, in general, not rapidly exhibited; and to produce a cure, according to Kopp, the remedy must be persisted in for at least four weeks, and commonly for some months.

Kopp suggested, that owing to the similarity of the effects of this oil to those of iodine, its efficacy might be owing to its containing the latter; and some chemical investigations, made by him in the year 1836, confirmed the suggestion.† The quantity is extremely small, but — Kopp supposes — like the steel in chalybeate waters, as the iodine is commingled naturally with the oil, it may exert a much greater effect than if it were added artificially in the like quantity. This is the opinion, also, of Dr. J. H. Bennett;‡ but Delcour§ and Panck¶ think it very problematical. Experiments by L. Gmelin,¶ show, that the genuine oil contains iodine, whilst the spurious does not. It has likewise been detected by Hausmann, Bley, Brandes, Springmühl,** and W. Stein.†† Herberger‡‡ found both iodine and bromine in it.

As respects its administration in disease, it has been employed — especially in Germany — as a domestic remedy in

1. *Rheumatism*, in which its reputation has been favourable.

* Riecke, Die neuern Arzneimittel, S. 352, and 2te Auflage, S. 542. Stuttgart, 1840; also, Klencke, cited in Brit. and For. Med. Rev., Oct. 1842, p. 443.

† Hufeland und Osann's Journal, 1836; Annalen der Pharmacie, xxi. und xii.; and Bulletin Général de Thérapeutique, No. xx. Oct. 30, 1837.

‡ Treatise on the Oleum Jecoris Aselli, or Cod Liver Oil, &c. &c. London, 1841.

§ Bulletin Médical Belge, Juin, 1841, p. 254.

¶ Zeitschrift für die gesammte Medicin, Juli, 1842, p. 282.

¶ Bulletin Général de Thérapeutique, Mai, 1840.

** Riecke, Op. cit. 2te Auflage, S. 541. Stuttgart, 1840.

†† Journal für Praktische Chemie, B. xxi., and Journal de Pharmacie, Février, 1841, p. 94.

‡‡ Pereira, Op. cit. p. 1866.

In the year 1782, it was highly recommended in *chronic rheumatism* by Dr. J. Percival,* and in 1807 by Dr. Bardsley,† who states, that it was in high repute in Lancashire. In the year 1835, Brefeld wrote a monograph on it, in which, resting upon numerous indigenous and foreign experiments, he maintained it to be a remedy of great and specific efficacy in every form of chronic and actual rheumatism; and since then his testimony has been corroborated by that of Spiritus,‡ Möning,§ Schütte,|| Wesener,¶ Osberghaus,** Günther,†† Volkmann,‡‡ Kopp, Rust,§§ Moll,|||| and Panck.

By many, its use has likewise been advised in *gouty affections*; but Brefeld esteems it ineffectual in actual gout; and Taufflied¶¶ affirms, that it is of no avail in gouty arthritis.

2. *Scrophula and Rickets*. — In these diseases, it would seem to be more efficacious than in rheumatism. Brefeld, indeed, asserts that he has found no remedy equal to it, in cases where the osseous tissue is permanently affected, — as in the different shades of *rickets*, *arthrocace*, *spina ventosa*, and *caries scrophulosa*.*** next to these, it has been extolled in *affections of the chyliiferous vessels* and *internal glands*, especially when they present themselves under the chronic form of *atrophy*. In *affections of the external glands*, its efficacy was less striking and rapid; Taufflied, indeed, states, that it is of no avail in the swellings of any lymphatic glands excepting those of the abdominal cavity. Its action is almost null in *scrophulous affections of the skin*, *ophthalmia*, *discharges from the ear*, &c., unless when applied externally, in which cases, as well as in *external glandular swellings of a scrophulous character*, it was especially useful. The slighter forms of *scrophulous eruptions* disappeared, without any unpleasant sequelæ, by simply smearing them with the oil; the more obstinate forms, by the simultaneous use of appropriate internal agents, of which Brefeld prefers *æthiops antimonialis* to all others. *Scrophulous inflammation of the eyes* disappeared frequently and rapidly by simply smearing the eyelids with the oil.†††

* Lond. Med. Journ. iii. 393.

† Reports from Hospital Practice, p. 18, Lond. 1807.

‡ Rust, Magazin, Band. xvi. 566.

§ Ibid.

|| Horn's Archiv. 1824 (July and August).

¶ Hufeland's Journal, 1824, Heft. v. (May.)

** Ibid. 1825. Heft. iii. (September.)

†† Ibid. 1824. Heft. ii. (August.)

‡‡ Ibid.

§§ Rust's Magazin. xx. 563.

|||| Richter's Specielle Therapie, x. 468. Berlin, 1828.

¶¶ Gazette Médicale, Nov. 9, 1839.

*** Sourzac, Journ. de Méd. et Chir. Prat. Mars, 1842, p. 110.

††† Piffard, Bullet. Général. de Thérap. Mai, 1840.

Kopp extols it in scrophula and rickets, both when internally and externally exhibited ; and in *porrigo*, its external application was found by him to be highly serviceable.

Numerous trials with the remedy by other physicians — as by Schenck, Schütte, Von dem Busch, Gumpert, Fehr, Rösch, Schimdt, Knod von Helmenstreit, Heineken, Münzenthaller, Beckhaus, Spitta, Günther, Roy, Gouzée,* Taufflied,† Jüngken,‡ and others, confirm its great efficacy in scrophulous and rachitic affections.§ Schenck,|| indeed, esteems it as certain a remedy in scrophula and rickets as cinchona is in intermittent fever.

Both Kopp and Brefeld recommend it highly in *strumous pulmonalis of strumous origin*, occurring especially in youth, and Rayé¶ speaks in the highest terms of its efficacy in *chronic inflammation of the lungs and stomach*.

The efficacy, of the oil in scrophula suggested its administration in cases of —

3. *Tubercles* ; — and, accordingly, it was prescribed by Hankel, whose experiments led him to advise a further trial of it. Riecke** refers to a case of the kind confirming Hankel's observations, which occurred to Dr. Pagenstecher, of Elberfeld ; and Richter, of Wiesbaden, Professor Alexander, of Utrecht, and Häser, of Jena,†† seem to have experienced equally satisfactory results. M. Taufflied,‡‡ however, considers its action to be doubtful or null in *scrophulous phthisis*, when at all advanced.

Carron du Villards§§ extols the codliver oil in *opacities of the cornea*, whether resulting from slight ulceration, or from interlamellar effusion. It is only applicable after the inflammation has disappeared. A drop or two of the oil is then placed on the cornea with a camel's hair pencil. Sometimes, even the white oil is too stimulating : it is then necessary to dilute it with oil of sweet almonds : in other cases, the white oil is not sufficiently stimulating ; when the brown must be used.

4. *Chronic cutaneous diseases*. — In these affections, codliver oil has been given with advantage by Richter ; and it is suggested, that the greater success obtained by him than by Brefeld may have been owing to his having administered the remedy in much

* Bulletin Médical Belge, Janvier, 1838, p. 6.

† Gazette Médicale de Paris, Août 12, 1837 ; and Nov. 9, 1839.

‡ Lond. Med. Gazette, April 20th, 1839, p. 126.

§ Riecke, Op. cit. S. 356, und 2te Auflage, S. 542. Stuttgart, 1840. See also, Taufflied, in Gaz. Médical de Paris, Nov. 1839.

|| Hufeland's Journal der practisch. Heilkunde, Mars, 1838.

¶ Annales de la Société des Sciences, Nat. de Bruges, Encyclographie des Sciences Médicales, Mars, 1840, p. 100 ; and Sept. 1840, p. 10.

** Op. cit. S. 356.

†† Hufeland's Journal. B. lxxxvi. 1838.

‡‡ Gazette Médicale, Nov. 9, 1839.

§§ Bulletin Général de Thérapeutique, Oct. 30, 1835.

larger doses. Richter's trials were numerous, and were made through a period of three years; they are, therefore, highly deserving of attention. He says;—that the impure, yellowish-brown, and odorous oil should be selected, as it is the most active;—that at least six, and never more than ten spoonfuls should be administered daily to adults;—that it must be continued for a long time, as the first traces of a favourable impression are generally somewhat late in presenting themselves,—commonly four weeks, and, in very obstinate cases, later;—so that usually from six to twelve weeks are required for a cure; and, lastly, that the diet must be regulated, and every thing difficult of digestion, flatulent, fatty, strongly salted, or acid, be carefully avoided. In this manner, he treats *tetter*, *inveterate itch*, and *tendency to the formation of boils*.

Kopp's experiments agree with those of Richter, as to the internal use of the oil in *tetter*; he esteems it to act by "improving the humours." He found it, also, of use, in cases of *dry tetter*, when rubbed on the part. In some *troublesome affections of the skin*, especially of the hands, conjoining the characters of *impetigo*, with *erysipelatous redness and swelling*, and inducing the most severe suffering, Dr. Marshall Hall* speedily succeeded in restoring the textures to a healthy condition by the external use of the codliver oil, after all other remedies had been tried fruitlessly. For *rhagades* and *chaps*, he says, it is a preventive, and a speedy cure; and it is productive of great benefit in *eczema*, and other diseases inducing *excoriation and fissures of the skin*.

5. In cases of *tumours of the mammæ* in young females, Kopp found the oil useful, when administered for some time, conjoined with the application of leeches to the affected part.

6. In the Charité, at Berlin, the oil was given with advantage in *coxarthrocace*, in doses of four ounces every morning;—the mouth being rinsed afterwards with peppermint tea, and a cupful of this tea, or of coffee, being drunk afterwards.

7. Kopp also affirms, that he cured a case of *chorea* by it, which had supervened on an attack of gout.

METHOD OF ADMINISTERING.

The dose of the codliver oil for an adult is from half a spoonful to three spoonfuls, two or three times a day. To children, it is given by tea-spoonfuls. Its unpleasant taste can scarcely be corrected by admixture with other agents; for which reason, many prefer to give it in the pure state, taking afterwards some

* Lond. Med. Gazette, Sept. 1832.

peppermint lozenges. It is also recommended to be given united with coffee, or with lemon juice, or in the form of emulsion. Kopp prescribes it in the pure state, advising that the mouth should be rinsed with water, and that some dry bread should be eaten after it.

Mistura olei jecoris aselli.

Mixture of codliver oil.

R. Ol. jecor. asell. f.℥j.
 Liq. potass. carb. f.℥ij.
 Ol. calami, gtt. iij.
 Syrup. cort. aurant. f.℥i. M.

Dose. — One or two tea-spoonfuls, morning and evening, in cases of *rickets*. *Fehr.*

R. Ol. jecor. aselli,
 Syrup. cort. aurant.
 Aquæ anisi, āā. f.℥j.
 Ol. calam. aromat. gtt. iij. M.

Dose. — A spoonful, morning, noon, and night; in *gouty swellings, rickets, &c.*

Rüsch.

Emulsio olei jecoris aselli.

Emulsion of codliver oil.

R. Ol. jecor. asell. alb.
 Vin. Hungaric. (vel Malag.) āā. f.℥iv.
 Acac. ℥j.
 Fiat emulsio, cui adde
 Syrup. cort. aurant. f.℥j.
 Elæosacchar. menth. pip. ℥ij.*

Dose. — Two table-spoonfuls, two or three times a day; shake the mixture. *Brefeld.*

* The *elæosaccharum* or *oleosaccharum menthæ piperitæ* is officinal in the Pharmacopœias of Austria, Denmark, Hanover, Oldenburg, Prussia, &c. It is made by triturating eight drops of the essential oil of peppermint with an ounce of sugar.

Syrupus olei jecoris aselli.

Syrup of codliver oil.

- R. Ol. jecor. aselli. f.℥viiij.
 Acac. pulv. ℥v.
 Aquæ, f.℥xij.
 Syrup. commun. f.℥iv.
 Sacchar. ℥xxiv.

Make an emulsion of the four first ingredients; dissolve the sugar at a moderate heat; clarify, and add

Aq. flor. aurant. f.℥ij.

*Duclou.**

Linimentum olei jecoris aselli.

Liniment of codliver oil.

- R. Ol. jecor. aselli, f.℥ss.
 Plumbi acetat. ℥ij.
 Vitell. ovor. (seu adipis), ℥iij. M.

For external use in cases of *ulcers, fistulæ, &c.*

Brefeld.

CVIII. O'LEUM SINA'PIS.

SYNONYMES. Oleum Æthereum seu Volatile Seminum Sinapis, Oil of Mustard Seed.

French. Huile Volatile de Moutard.

German. Ætherisches Senföl.

This preparation has been recently recommended to the notice of practitioners in Germany, by Dr. Meyer, of Minden, especially; at whose suggestion, numerous experiments were made with it at the Charité, in Berlin, the favourable results of which have been published by Dr. Wolff.†

* Journal de Pharmacie, Sept. 1837.

† Schmidt's Jahrbucher, 1837.

METHOD OF PREPARING.

M. Fauré, in France, and M. Hesse, in Germany, found that if bruised mustard seed be placed in a still with cold water, much more essential oil is obtained than if hot water or steam had been at once employed. M. Hesse, indeed, advises, that the seed should be macerated with cold water for several hours before the distillation is commenced. It would seem, too, that acids, alcohol, &c., exercise the same influence in preventing the separation of the oil.

EFFECTS ON THE ECONOMY IN HEALTH.

Volatile oil of mustard is of a yellowish-white colour. It exhales so strong a smell of mustard, that the attempt to test its odour instantaneously excites a violent pungent sensation in the nose, and tears in the eyes. Its acridity is so great, that its application to the sound skin immediately occasions a sense of burning, and intense redness and vesication on the parts with which it comes in contact.

EFFECTS ON THE ECONOMY IN DISEASE.

Mustard seed oil may be applied either externally or internally. For the first object, Dr. Meyer advises a solution in alcohol (twenty-four drops to the ounce), or in oil of almonds (five or six drops to the dram). In Berlin, the former of these is used. Even this solution exhales so strongly the characteristic odour of mustard, that simply smelling it induces a sense of pungency in the nose, as well as tears in the eyes. Owing to the great volatility of this oil, its properties and efficacy are soon lost; and the strength of the spirituous solution becomes less and less, when the fluid is preserved for a long time in vessels that are not accurately closed, or are frequently opened for the administration of the remedy and afterwards not carefully attended to. It is therefore advisable in practice, that only small quantities should be prescribed at a time, and that these should be kept in well-closed vials, and in a cool place.

The mode of external administration may be one of two — according to the sensibility of the skin, and the effect it may be desirable to induce. It may consist either in rubbing the liquid on a part of the surface, or in applying strips of linen wetted with it. The first method is advisable where the skin is delicate — as in the case of women and children, and in those whose healthy

sensibility has not been diminished — as by paralytic affections. The fluid, when rubbed on the surface, very quickly evaporates, in the course of a few minutes, and excites a vivid sensation of burning, with bright redness of the surface, which disappears in the course of a few hours at the farthest.

The augmented sensibility, produced by friction with the solution of the oil, continues generally for a longer period ; and, consequently, if a fresh application be needed at a short interval — say in from four to six hours — it must be made on the neighbouring parts, avoiding those first implicated. It is sufficient to use the remedy in this manner two or three times a day.

The application of the oil by means of strips of linen is adapted for skins such as those of men, which are thicker, and less sensible, as well as for morbid cases in which the healthy sensibility has been depressed. The size and shape of the strips must be determined by circumstances. The linen, dipped in the oil, is placed upon the prescribed portion of the skin, and suffered to dry, which generally happens in about eight minutes. Burning pain immediately succeeds, and is often so insupportable, that the patients object to wait until the linen is dry, and it has, therefore, to be removed earlier. Beside the more violent pain, produced by this mode of applying the oil, the redness of the skin is much greater, and in many cases vesication succeeds.

If the application be made twice a day, morning and evening, this is sufficient for the treatment of chronic diseases ; but friction cannot be made on the same part of the surface on the same day, on account of the severe pain and vesication, which would be induced.

This method of applying the oil is considered to be especially proper in the case of the trunk and the extremities ; whilst the first method is generally to be preferred, where it is desirable to use it upon the face, behind the ears, or on the neck.

The Oleum sinapis is indicated, wherever a counter-irritant or local excitement is demanded. Riecke* advises it in *chronic cases unaccompanied by fever*, as well as in *light febrile affections*, where a gentle excitant may be needed ; and in such fevers as are conjoined with a torpid state of the system, and which require the use of excitants. He regards its powerfully excitant action as constituting it a most useful article in our lists of antagonising or derivative, as well as of excitant agents. In the first relation, Wolff employed it with advantage both in *sub-inflammatory diseases*, and in *nervous affections* not of an inflammatory character — as in *subacute rheumatism* of the joints, aponeuroses and muscles, and in *chronic rheumatism* of those

* Die neuern Arzneimittel, S. 341 ; und 2te Auflage, S. 519. Stuttgart, 1840.

parts, where blisters would be serviceable; and for which it may be substituted with advantage, in consequence of its not being attended with the inconveniences occasionally produced by the latter on the urinary organs. He employed it, likewise, in *rheumatic neuralgia*, — *otalgia*, *odontalgia*, *prosopalgia*, and *ischias*, — bloodletting being prescribed or not, according to circumstances; and, also, as a palliative in *chronic neuralgia*, *colic of the hysterical kind*, and *gastrodynia*.

As an excitant to arouse the vital activity in debilitated parts, Wolff used the solution of the oil in *paralysis*, in the *sequelæ of protracted rheumatism*, and in *neuralgia*, which was probably the result of exudation into the neurilema, &c. He gave it, also, internally several times with good effect, in *disorder of the stomach*, accompanied by too great a secretion of mucus (*Ver-schleimung des Magens*), and producing complete loss of appetite. Two drops were formed into a mixture of six ounces, by the aid of gum arabic and sugar; and of this a table-spoonful was given every two hours.

In cases of *atonic dropsy*, it has been conceived, advantage might, in many cases, be derived from the internal use of this oil; as in the majority of those to whom it was given internally, the urinary secretion was largely augmented by it.* Kuhn,† indeed, exhibited it in a case of atonic dropsy as a sequel of intermittent fever with signal benefit.

The Oleum Sinapis has been received into the Hamburg Pharmacopœia.

CIX. O'LEUM TIG'LII.

SYNONYMES. Oleum Crotonis, Croton Oil.

French. Huile de Pignon d'Inde.

German. Krotonöl, Crotonöl.

The seeds of *Croton Tiglium*, or purging croton — a tree indigenous in the Molucca Isles, Ceylon, Java, &c., and which belongs in the SEXUAL SYSTEM to Monœcia Monadelphia, and to the NATURAL FAMILY Euphorbiaceæ — are characterised by their acrid drastic properties — which, indeed, belong to the whole family. These seeds were carried by the Dutch to Europe, two

* Riecke, Op. cit. S. 343, and 2te Auflage, S. 520, Stuttgart, 1840.

† Medicinische Zeitung, No. 38. Sep. 21, 1836, S. 191.

centuries ago, and were admitted into the old Pharmacopœias under the names *Grana Tiglii*, *G. Tili*, *G. Moluccæ*, &c., being prescribed as a drastic cathartic, but owing to their too violent operation, which frequently induced unpleasant results, they fell subsequently into entire disuse. The oil of croton was also introduced into Europe about the same period, and was occasionally used internally. It had, however, sunk into total neglect, when attention was recalled to it by Dr. Conwell, a physician in the English East India Company's service at Madras, by whom its employment was reintroduced into Europe; and, in a short time, it acquired so much repute as an active cathartic, that it was received into various Pharmacopœias.*

Croton oil is a thickish fluid, of a honey-yellow colour, has a disagreeable smell, and a very acrid burning taste, so that it excites inflammation of the tongue and fauces. It is a fixed oil, having a very acrid matter associated with it, which appears to possess acid qualities — *crotonic acid*. In ether and turpentine it is wholly soluble; in alcohol, partially so.

It is imported chiefly from Madras, but partly from Bombay, and is prepared like castor oil, being strained, however, instead of being boiled. Croton oil is likewise expressed in England.† About 50 *per cent.* may be obtained in this way; and 10 *per cent.* more may be removed by the solvent action of sulphuric ether, which is afterwards expelled by a gentle heat.‡

EFFECTS ON THE ECONOMY.

Croton oil holds a distinguished place amongst cathartics, inasmuch as it can be given in small doses; and in cases of great torpor of the intestines, its action is very certain. Even a drop commonly produces eight or ten fluid evacuations; but, at times, in unusual torpor of the canal, as many as four or five drops, and even more, have been given in the course of ten or twelve hours. Like most of the drastic cathartics, it occasions tormina, but these are less distressing than the burning sensation which it commonly excites in the pharynx, and which is least felt when the oil is given in the form of pill or lozenge. Not unfrequently, also, it causes nausea, often ending in vomiting in delicate persons, or where the dose has been large, but without interfering materially with the cathartic effect. At times, it is formed into a soap with caustic soda — *Sapo olei tiglii* — which is given in doses of from

* Recherches sur les propriétés médicales et l'emploi de l'huile du Croton Tiglium, &c. Paris, 1824.

† Pereira, Elements of Mat. Med. and Therap. ii. 1116, Lond. 1842; or Amer. edit. by Dr. Carson, Philad. 1843.

‡ Christison, Dispensatory, Edinb. 1842.

one to three grains. This soap is said to be less excitant, and to occasion less pain than the pure oil, and it has the advantage, that the dose can be better apportioned.

As with other cathartics, the incautious employment of croton oil may occasion inflammation of the intestinal canal, and therefore, it need scarcely be said, its use during inflammation of the canal is contraindicated. It does not appear to affect any other secretory organs than those of the bowels, although some physicians affirm, that they have remarked an increase of the urine after its use.

Occasionally, when rubbed, in the quantity of four or five drops, around the umbilicus, it would seem to have acted as a cathartic, and even its odour has been known to produce the same effect.

Like other active cathartics, it has been employed as an anthelmintic, especially in cases of *tape-worm*, by Poccinotti, and others, and with success.*

Croton oil has been used externally as a revellent or counter-irritant — at times to induce a cathartic effect ; but in this respect it is uncertain.† Rubbed on the surface in small quantity, it induces inflammation of the skin, which gradually disappears of itself. When the friction is longer continued, pustules are caused, which, when they are numerous, run together or are confluent, and around the spot where the confluent eruption is seated, papulæ or pimples appear over a wider extent, which are transformed into pustules, and are surrounded by a red base or areola. When the pustules are discrete, they dry up more rapidly than when they run together ; and in the latter case they commonly form scabs. Friction readily excites pustulation on the head, face, neck, chest, and on those parts of the extremities where the skin is thin. Where it is thicker, the effect is of course induced with more difficulty. Commonly, the eruption is perceptible in twelve hours after the first friction, but at times not till a later period ; very rarely is the second friction ineffectual. In the course of from three to six days, the eruption again disappears.

The pain usually commences in about an hour after the rubbing, being at first nothing more than a slight itching and burning, which gradually, but markedly, augments ; yet the eruption is never so painful as that caused by the ointment of tartarised antimony, or by the plaster of the same agent, with which it is capable of fulfilling the same indications.

These frictions with croton oil are adapted for all cases in

* Richter's *Specielle Therapie*, B. x. S. 248. Berlin, 1828.

† See a case of *Ileus* cured in this manner, by Dr. Susewind, in Casper's *Wochenschrift für die gesammte Heilkunde*, Jun. 24, 1837, S. 404.

which local counter-irritation is required. It is important, however, to bear in mind, that it may in this manner act on the bowels, and hence, that it may not be adapted for intestinal disorders, in which it is not desirable to produce such an effect. Frictions with it have been recommended of late by many physicians — as by Andral,* Elliotson, Hutchinson,† Short, Landsberg, Romberg, and others, in the following affections:— In *chronic inflammations*, and such as have a tendency to exsudation; in *chronic rheumatic* and *gouty diseases*, in *aphonia*‡ and *chronic hoarseness*,§ *phthisical affections*, especially in incipient phthisis; and in the *neuroses* — as *spasmodic asthma*, *hooping-cough*, *paralysis*,|| &c. Gunther¶ advises them as almost specific in *rheumatic odontalgia* and in *otalgia*.

In *neuralgia faciei*, the cause of which is considered by Sir Charles Bell** to be seated primarily in the intestinal canal, and remotely in the fifth pair of nerves, croton oil has been recommended as a superior purgative, and this, as well as other forms of *neuralgia*,†† would seem to have been removed by it, doubtless, by the revulsion it excites upon the intestinal nerves. But it need scarcely be said, that it possesses no specific virtue, as has been imagined by some. In the only case of genuine *tic* in which Dr. Christison tried it, no benefit whatever was derived.

Croton oil has likewise been used as a direct excitant. Campanelli‡‡ gives a case of *paralysis of the upper eyelid*, which was promptly relieved by the application of four drops to the affected lid, and the eyebrow.

MODE OF ADMINISTERING.

Internally, the dose is from one-fourth, or one-half, a drop, to two drops, given every three or two hours, or more frequently, if necessary. The dose is rarely carried higher, except in des-

* Gazette Médicale, Janv. 1832, and Archives Générales, Août, 1833.

† London Lancet, May, 1833, and Dr. Sauer, in Medicin. Zeitung, Aug. 10, 1836, S. 158, and Dunglison's Amer. Med. Intel., Nov. 1, 1837, p. 286.

‡ Romberg, in Wochenschrift für die gesammte Heilkunde, 1835.

§ Dr. Sauer, in Medic. Zeitung, Aug. 10, 1836, S. 158.

|| Boileau (Paralysis of the Facial Nerve), Bulletin Médical du Midi. Avril, 1839.

¶ Berliner Medicin. Central, Zeitung, Nov. 19, 1838.

** Practical Essays, Edinb. 1841, p. 101. See, also, Dr. Allnat, on Tic Douloureux, Lond. 1841.

†† J. Cochrane, Lond. and Edinb. Monthly Journ. of Med. Science, July, 1841; Dr. J. A. Easton, Lond. Lancet, Jan. 29, 1841; and Dr. Newbigging, Edinb. Med. and Surg. Journ. Jan. 1841; or Amer. Journ. Med. Science, Jan. 1841, p. 209.

‡‡ Annali Universali di Medicina, July, 1835.

perate cases, and in mental affections, for which it is peculiarly appropriate.

It may be given either in the form of emulsion or of pill. Hahnemann* and Hufeland recommended it as a substitute for castor oil, which is expensive in Germany; advising, that a drop of croton oil should be added to an ounce of oil of poppies, and that the mixture should be called *Oleum Ricini Officinale*. This preparation is well adapted for emulsions.

In *apoplexy*, or other *comatose diseases*, it may be given on a piece of sugar, which may be introduced into the throat, or be simply placed on the back of the tongue. When applied externally, to excite an eruption, from four to six drops, or even more, may be rubbed in twice a day. For women and children, a single application may be sufficient; but if the skin be thick and insensible, it will be well to rub it previously with flannel, or to apply first a rubefacient, especially when it is desirable to produce the effect speedily. On the other hand, where the skin is excitable, the croton oil should be mixed with from one to four or five parts or more of olive oil, oil of turpentine, or soap liniments.†

Pilulæ olei tiglii.

Pills of croton oil.

R. Olei tiglii, gtt. iv.
Micæ panis, q. s. ut fiant pilulæ viij.

Dose.— One, or two, or more.

R. Olei tiglii, gtt. v.
Saponis,
Acaciæ, āā. ℥j.
Misce et fiant pilulæ xx.

Dose. — One to three.

Sundelin.

R. Olei tiglii, gtt. ii.
Micæ panis
vel
Saponis, ℥j.
M. et divide in pilulas viij.

Dose. — One to four.

* Apotheker Lexicon, B. ii. Abth. 1. S. 203.

† See the Author's Gen. Therap. and Mat. Med. ii. 265. Philad. 1843.

Pilulæ olei tiglii compositæ.

Compound pills of croton oil.

- R. Olei tiglii, gtt. x.
 Ext. colocynth. comp. ℥i.
 Ol. menthæ piper. gtt. viij. M.
 et fiant pil. xviii.

Two for a dose — to be repeated at short intervals, in cases of *obstinate constipation*.

Haustus olei tiglii.

Draught of croton oil.

- R. Tinct. ol. tiglii, f.℥ss.
 Syrup.
 Mucil. acaciæ, āā. f.℥ij.
 Aquæ destill. f.℥ss. Fiat haustus.

After swallowing a little milk, this draught must be taken very quickly, and be washed down with the same diluent.

Nimmo.

Emulsio olei tiglii.

Emulsion of croton oil.

- R. Olei tiglii, gtt. iij.
 Olei amygdal. f.℥ss.
 Acac. ℥ij.
 Misce sensim terendo cum
 Syrup. flor. aurant. f.℥j.
 Aq. anthemid. f.℥v. M.

Dose. — A spoonful, every two hours, until it operates — shaking the vial.

*Phoebus.**

- R. Olei tiglii, gtt. i. — ij.
 Olei anthemid. gtt. ij.
 Terendo misce cum
 Mucilag. acaciæ,
 Syrup. amygdal. āā. f.℥ss. M.

Dose. — A tea-spoonful, every two hours — shaking the vial.

Lockstädt.

* Handbuch der Arzneiverordnungslehre, Th. ii. Berlin, 1836.

Mistura olei tiglii.

Mixture or emulsion of croton oil.

R. Olei tiglii, gtt. ii.
 Mucilag. acac. f.℥ij.
 Aquæ, f.℥j. M.

Dose. — A fourth part, every two hours, until the desired effect is induced.

Mistura olei tiglii saponacea.

Saponaceous mixture of croton oil.

R. Olei tiglii, gtt. viij.
 Potassæ, gr. vj.
 Aquæ destillat. f.℥ij. M.

This is a substitute for the *Sapo Olei Tiglii*, which is troublesome in the preparation.

Dose. — Three to six drops.*

R. Ol. tiglii, gtt. ij.
 Sacchar. ℥ij.
 Acaciæ, ℥ss.
 Tinct. card. f.℥ss.
 Aquæ destillat. f.℥x. M.

Dose. — Two dessert-spoonfuls, to children ; to be repeated every three or four hours, if necessary.

Trochisci olei tiglii.

Lozenges of croton oil.

R. Olei tiglii, gtt. ij.
 Sacchar. ℥j.
 Mucilag. acaciæ, q. s. ut fiant
 Trochisci, non torrendi, No. viij.

Dose. — One every two hours, until the desired effect is induced.

Seiler.†

* Ellis's Medical Formulary, 6th edit. by Dr. S. G. Morton, p. 36. Philad. 1842.

† Hufeland's Journal, B. lix. St. 4. S. 134 ; und Rust's Magazin, B. xviii. St. 2, S. 358.

Sapo olei tiglii.

*Soap of croton oil.**Sapo crotonis.*

R. Olei tiglii, partes ij.

Liquor. potassæ, partem j.

Triturate in the cold, and when the mixture has acquired the proper consistence, run it into moulds of pasteboard, and, in the course of a few days, remove it by slices.

Dose. — Two or three grains in water, or in the form of pill.
Caventou.

Linimentum olei tiglii.

*Liniment of croton oil.**Linimentum crotonis.*

R. Ol. tiglii, p. i.

— olivæ, p. v. M.

To be rubbed on the skin, night and morning, until pustulation is induced.

Unguentum olei tiglii.

Ointment of croton oil.

R. Olei tiglii, ℥x. — xxx.

Adipis, ℥ss. M.

A little of this to be rubbed on the part so as to excite the peculiar eruption.

Emplastrum olei tiglii.

*Plaster of croton oil.**Sparadrap de croton.*

M. Bouchardat melts over a very gentle fire, 4 parts of *diachylon plaster*; and when it is in a semifluid state, he mixes with it 1 part of *croton oil*. This he spreads upon linen, so as to form an adhesive and irritating plaster.

M. Caventou prefers the following form, as he considers the degree of heat employed in the process of M. Bouchardat may interfere with the powers of the croton oil.

R. Adipis, p. iiss.

Ceræ, p. ss.

Ol. tiglii, p. i.

The wax and lard must be melted, and when nearly cold, the oil be incorporated.*

Pope† recommends a TINCTURA GRANORUM TIGLII, or a *tincture of the seeds*, to be made of two ounces of the *seeds* from which the rinds have been carefully removed, to one ounce of *alcohol*. This is allowed to digest for six days, and is then filtered. The smallest dose for an adult is twenty drops. This preparation, he says, has the advantage of excluding the more acrid drastic matter contained in the epidermis and husk, whilst the kernel affords cathartic material enough to act powerfully and certainly.

CX. PAULLINIA.

Paullinia is an extract from a plant of the same name, a native of Brazil. It is prepared by the Indians, and seems to possess considerable excitant powers. M. Gavrelle presented a specimen of it to the *Société de Médecine*, of Paris, as well as a new alkali, which had been separated from it by two chemists of Paris. Both the extract and the alkali are very bitter, and somewhat resemble Caféin. M. Gavrelle states, that Paullinia is obtained from the *Paullinia sorbilis*; FAMILY, Sapindacæ. M. de Chas-

* Bulletin Général de Thérapeutique, Mars, 1842, and Journ. de Pharm. Avril, 1842, p. 453.

† Medico-Chirurgical Transactions, vol. xiii. p. i.

tetus found it to be composed of gum, starch, a resinous matter of a reddish-brown colour, a fat oil, tannic acid, and a crystallizable substance, possessing the chemical properties of cafein.

EFFECTS ON THE ECONOMY IN DISEASE.

In Brazil, and the neighbouring countries, it is given in the form of Tisane — the powder being mixed with cocoa — in *diarrhœa* and *dysentery*. As a tonic, M. Gavrelle has employed it successfully in *chlorosis*, *tedious convalescence*, *paralysis*, the *colliquative diarrhœa of phthisis*, and *hemicrania*.

According to Von Martius, an extract is prepared in Brazil from *Paullinia sorbilis*, which is known there under the name of *Guaraná*, and is administered in similar pathological cases.*

MODE OF ADMINISTERING.

The HYDRO-ALCOHOLIC EXTRACT OF PAULLINIA is considered to represent the plant most accurately in its chemical properties. Of this, M. Gavrelle has given formulæ for *Lozenges*, *Syrup*, *Pills*, *Powder*, *Tincture*, and *Ointment*.†

Trochisci paulliniæ.

Lozenges of paullinia.

R. Extract. hydro-alcoholic. paulliniæ, ℥vss.
Sacchar. (vanillâ odorizat.) ℥iiss.

Make into lozenges, each containing 10 grains.

Syrupus paulliniæ.

Syrup of paullinia.

R. Extract. hydro-alcohol. paullin. ℥iiss.
Syrup. Oij.

Half a fluid ounce may be given in the 24 hours.

* See art. *Guaraná*, in Dict. Univers. de Mat. Méd. par Méral et De Lens, tom. ii., p. 365. Bruxelles, 1838; Journal de Pharmacie, and Amer. Journ. of Pharmacy, Jan. 1841, p. 340; M. Dechastetus, Journ. de Pharm. Août, 1840; J. J. Virey, Ibid., and Von Schlechtendal. Encyclopäd. Wörterb. der Medicin. Wissenschaft. xxvi. 433. Berlin, 1841.

† Journal de Chimie Méd., and Encyclographie des Sciences Médicales, Juillet, 1840, p. 230. See, also, American Journal of Pharmacy, Oct. 1840, p. 208.

*Pilulæ paulliniæ.**Pills of paullinia.*

R. Extract. hydro-alcohol. paullin. q. s.

To be made into pills, each containing a grain and a half.

*Pulveres paulliniæ.**Powders of paullinia.*

R. Paullin. in pulv. ʒi.
Sacchar. aromatizat. ʒss. M.

For a dose.

*Tinctura paulliniæ.**Tincture of paullinia.*

R. Ext. hydro-alcohol. paullin. ʒi.
Alcohol. (22°) Oi. M.

*Unguentum paulliniæ.**Ointment of paullinia.*

R. Ext. hydro-alcohol. paullin. ʒij.
Adipis. ʒij. M.

CXI. PHLORIDZINA.*

SYNONYMES. Phloridzinum, Phloiorrhizinum, Phloridzia, Phloridzine, Phlorizin, Phloridzin.

German. Phloridzin, Phloiorrhizin.

This bitter principle exists in the bark of both the trunk and the root of the apple, pear, cherry, and plum tree.

* From φλοες, inner bark, and ρίζα, root.

METHOD OF PREPARING.

The following plan is recommended by M. de Koninck, its discoverer (1834 or 1835). — The *fresh bark of the root of the apple tree* is to be boiled for two hours with sufficient *water* to cover it: the decoction is to be decanted, and a second one made by the addition of more water. On uniting the two decoctions, and permitting them to stand for twenty-four hours, a deposition of phloridzin, in granular crystals, takes place. These are to be treated with *distilled water* and *animal charcoal* to purify them. An additional quantity is obtained by evaporating the mother waters to one-fifth. At this degree of concentration, all the phloridzin is deposited. This method affords about one part in three hundred. Another plan yields five *per cent.* It consists in digesting the *fresh root* in *weak alcohol*, at a temperature of 120°, for about eight or ten hours, distilling off the greater part of the alcohol, and crystallising the residue.*

Phloridzin crystallises in silky spicula of a dead-white colour when in masses, or in long slender prisms or tables when crystallised with care. One thousand parts of water, at a temperature from 32° to 71°, only dissolve about one part; but at from 71° to 212°, water dissolves it in all proportions. It is also very soluble in pure alcohol at ordinary temperatures, although but slightly so in ether, even when boiling. It has no action on test papers. S. g. 1.429.†

EFFECTS ON THE ECONOMY IN DISEASE.

M. de Koninck found, that from ten to fourteen grains given for a dose, with a dram of sugar, produced the most marked effect in *intermittent fever*, where sulphate of quinia had failed. In four cases, reported by Dr. Van Mons,‡ of Bruxelles, the disease was arrested by the first sixteen grains: other cases required sixteen grains, a few hours before the first paroxysm; twelve grains before the second; six before the third; and four before the fourth. Five successful cases are likewise given by M. Mathysen,§ *élève interne* at the Hospital St. Pierre, Bruxelles; and

* Journal de Pharmacie, xxii. 78, and Amer. Journ. of Pharmac. vol. ii. new series, p. 240. See, also, M. Boullier, in Gazette Médicale de Paris, 17 Juin, 1837, and M. Marchand, Journ. de Chim. Méd. Avril, 1841.

† For some elaborate chemical researches on Phloridzine, M. J. S. Stass Annales de Chimie et de Physique, Dec. 1838.

‡ Bulletin Médical Belge, Mai, 1836.

§ Ibid. Oct. 1835.

M. Lebaudy* affirms, that its efficacy is so decided, that we cannot hesitate to class it with the most powerful febrifuges; and that it has this advantage over quinia, that it never induces gastralgia; yet M. Leonhardt† is satisfied from his various trials, that phloridzin does not possess any febrifuge virtue!

METHOD OF PRESCRIBING.

It may be given in the form of pill or of powder, like the sulphate of quinia. It was administered at the hospital at Bruxelles, in one case, in the way of *lavement*; — twenty-four grains being given in three *lavements*. The paroxysm returned, but was less violent. In two days afterwards, the same quantity was administered in the same manner, and the fever did not recur.

CXII. PIPERINA.

SYNONYMES. Piperinum, Piperium, Piperine, Piperin.
German. Piperin, Pfefferstoff.

This substance was discovered by M. Oerstädt, in the year 1819, in black pepper, *Piper nigrum*.‡ It is found, also, in *Piper longum*, and it has been presumed to be the same, or an analogous principle with the *cubebin* of *Piper cubeba*. It has been affirmed, that it exists only in black, and not in white pepper; but this is an error. Dr. Christison§ invariably obtained it from the latter in larger quantity than from the former, and more easily, because it is combined with less resin. M. Oerstädt at first regarded it as a vegetable alkali, but M. Pelletier subsequently analysed it, and proved it not to be such, but to bear a considerable analogy to resins, and not to be of a peculiar nature.||

Piperin has not been much used, except in Italy.

* Journal des Connaiss. Med. Chirurg. cited in Braithwaite's Retrospect of Medicine and Surgery No. 5, p. 129, Lond. 1842, where it is termed erroneously *Phloridrine*; and whence it is copied into the Amer. Journ. of the Medical Sciences, and into the American Journal of Pharmacy, for Jan. 1843, under the name *Phloridine*.

† Encyclographie des Sciences Médicales, Mai, 1838.

‡ Journal de Physique, No. 2, 1820, and Gazette de Santé, Mai 25, 1820.

§ Dispensatory, p. 698. Edinb. 1842.

|| Examen chimique du Poivre, par J. Pelletier. 8vo. Paris.

METHOD OF PREPARING.

Let two pounds of *black pepper*, bruised, be digested, at a gentle heat, in three pounds of *alcohol*, at 36° (.837). This mixture must afterwards be raised to ebullition, then suffered to remain at rest, and grow cold ; when it must be decanted, and the operation be repeated with fresh *alcohol*. The two solutions must then be mixed together, and two pounds of *distilled water* and three ounces of *muriatic acid* be added. The liquor becomes turbid, and a precipitate, of a deep gray colour, is thrown down, which is composed, in a great measure, of fatty matter. The deposit being separated, crystals may be collected on the filter and sides of the vessel. These are piperin. On adding *water* until the liquid is no longer rendered turbid, a fresh quantity is obtained.

The above process, which is that of Meli, is the same as one described by M. Pelletier. He has likewise procured it by the following method : — After having exhausted *pepper* by *alcohol*, and evaporated the alcoholic tinctures, a fatty or resinous matter is obtained : this must be subjected to the action of *boiling water*, which must be added again and again, until it passes off colourless. By dissolving this fatty matter — thus purified by washing — in *alcohol*, by the aid of heat, and leaving the solution to itself for some days, a multitude of crystals are obtained, which may be purified by solution in *alcohol* and *ether*, and by repeated crystallisation. The alcoholic mother waters, left to themselves, will furnish fresh crystals. This crystalline matter is piperin.

Piperin presents itself in the form of four-sided prisms, two of which — parallel to each other — are evidently broader than the others. In the pure state, it is of a white colour, and translucent : it is frequently, however, coloured yellow by portions of resin being combined with it. It has been affirmed, that when Piperin is quite pure it is bland ;* but Dr. Christison† states, that the very whitest crystals he was able to obtain, were as acrid as those which are brownish, and they emitted an intensely irritating vapour when thrown on a heated iron plate. It is inodorous, and of a feeble taste of pepper ; fuses readily by heat ; is not volatile, and is scarcely soluble in cold water, but somewhat more so in hot. In respect to its solubility in *alcohol*, testimony is discordant. According to Magendie, it dissolves very readily therein ; according to C. G. Gmelin, it is soluble only in small

* Dispensatory of the United States of America, 4th edit. p. 512. Philad. 1839.

† Op. cit. p. 697.

quantity in cold, but in tolerable proportion in hot alcohol, as well as in ether and in the volatile oils. The solutions taste acrid and peppery, and do not react on vegetable colours; — which shows that it is not an alkaloid, as the discoverer conceived. With acids, it forms no intimate chemical combinations; acetic acid, indeed, dissolves it in considerable quantity; it is, however, in great part, precipitated by water, and by evaporation the whole of the acid escapes. It is related to the resins.

EFFECTS ON THE ECONOMY.

Piperin has been exhibited chiefly by the Italian physicians for the cure of *intermittent fever*. Its employment was, doubtless, suggested by the use of pepper-corns as a popular remedy in that disease. According to Riecke,* the antiperiodic virtue of pepper is exhibited upon the healthy economy, — a few pepper-corns taken before the expected appearance of the menses, arresting them for several days. Of this, he himself has had no experience; but he affirms, that the females, in a district of southern Germany, have great confidence in their virtues.

Meli,† who treated many cases of intermittent with piperin, considers it as the best of all febrifuges, quinia not excepted. He forms twenty grains into ten pills, and gives these at intervals during the apyrexia. He ascribes the efficacy of the *oleum acre piperis* in the same complaint to the piperin it contains.

The febrifuge virtue of piperin has been confirmed by many other Italian physicians; by Brandolini, Bertini, Gordini, Torelli, and others. According to Brandolini, from forty to fifty grains are generally required to effect a cure. Bertini gave it in three doses during the apyrexia, to the extent of a scruple, made into pills with a bitter extract: after two or three doses, the fever was generally arrested. Gordini affirms, that relapses occurred less frequently after the use of piperin than after that of the sulphate of quinia. On the other hand, in the hospital at Turin, Christin was disappointed in it, and such seems to have been the result of the trials made by Chiappa.‡ In the year 1823, he administered it in ten or twelve cases, but was unable to detect any great antiperiodic property; not more than a fourth part of the sick experienced benefit, whilst, on the others, cin-

* Die neuern Arzneimittel, S. 361; und 2te Auflage, S. 522. Stuttgart, 1840.

† Nuove Esperienze, &c. Milan, 1823, 8vo.; and Annali Universali di Medicina, xxvii. 161, and xxviii. 22.

‡ Riecke, Op. cit. S. 361; und 2te Auflage, S. 553. Stuttgart, 1840.

chona acted like a charm. In general, a burning sensation was experienced in the stomach after taking it, as well as in the throat, with the same kind of feeling occasionally in the rectum, and in the whole abdomen ; and in two young individuals, the eyes were made red, and the eyelids, nose, and lips were swollen.

Piperin has, likewise, been employed by others beside the Italian physicians. Dr. Blom, of Utrecht, has given it in intermittents, but not with as much success as the quinia. According to him, the remedy, soon after it is taken, particularly in very impressible persons, occasions a sense of internal heat, especially in the epigastric region, and not unfrequently it causes perspiration, especially on the upper lip. Blom is, however, doubtful, whether these effects be ascribable to the piperin, or to a portion of the resin of the pepper remaining united with it. He is of opinion, that both in general debility, and in debility of the digestive apparatus, piperin merits a preference over sulphate of quinia, both because it can be better borne by the stomach, and because it acts more tonically upon it.

It has been given in intermittent fever, with great success, by Dr. Hartte,* Port of Spain, West Indies. He prescribed it as soon as the sweating stage was established, until 18 grains had been taken, and on the following day, when the intermission was complete, he directed the same quantity every three hours. It succeeded, in every case, in checking the paroxysm, and as soon as this was accomplished he gave, for some days, pills composed of *Pilula Hydrargyri*, Piperin, and Sulphate of Quinia, the formula for which is given below.

In inflammatory intermittents, as well as in those with gastric complications, piperin is to be avoided.

Magendie suggests that it should be given in *blennorrhœa*, in place of cubebs.

METHOD OF ADMINISTERING.

Pilulæ piperinæ.

Pills of piperin.

R. Piperin. gr. xij.

Extract. gentian. q.s. ut fiant pilulæ xij.

Dose. — One every hour during the *apyrexia of fever*.

* Edinb. Med. and Surg. Journ. Jan, 1841, p. 98.

Pilulæ piperinæ compositæ.

Compound pills of piperin.

R. Pil. hydrarg. gr. i.
 Piperin. gr. ij.
 Quinæ sulphat. gr. ij.
 Syrup. q. s. ut fiat pilula.

One to be taken morning, noon, and night.

Hartle.

CXIII. PLATINI PRÆPARATA.

SYNONYME. Preparations of Platinum or Platina.

EFFECTS ON THE ECONOMY.

The preparations of platinum have not been much used in medicine. Recently, experimental researches have been undertaken by M. F. Höfer,* in regard to their employment as physiological and therapeutical agents; and the following are the main results. Experiments were made on rabbits, dogs, and on himself, with the view of discovering the physiological action of the *perchloride of platinum* or *chloroplatinic acid*, of the *chloroplatinate of sodium* or the *double chloride of platinum and sodium*; of the *chloroplatinate of potassium*, and the *chloroplatinate of ammonium*. He found—*First*. That the chlorides of platinum are poisonous,—the perchloride in the dose of 15 grains; the chloroplatinate of sodium in that of 3ss. *Secondly*. The chlorides of platinum are less poisonous than the chloride of gold, and corrosive sublimate. *Thirdly*. The perchloride of platinum, in concentrated solution, produces violent itching or irritation of the skin, followed by a slight eruption on the part to which the solution has been applied. Taken internally, it first of all irritates the mucous membrane of the stomach, occasions headache, reacts on the nervous centre, and through it exerts a special alterative action on the fluids of the economy. *Fourthly*. The chloroplatinate of sodium produces no local

* Gazette Médicale de Paris, No. 48, 1840; and Journal de Pharmacie, Avril, 1841, p. 213.

irritation on the skin. Taken internally, it does not react on the nervous centres in as manifest a manner as the simple perchloride. It more especially increases the urinary secretion. *Fifthly.* The perchloride of platinum is a very efficacious remedy in the treatment of *syphilitic diseases*, and especially in those that have been of long duration, and are inveterate. *Sixthly.* The chloroplatinate of sodium is more proper for the treatment of recent syphilitic diseases. It is also very efficacious in the treatment of *rheumatic affections*. *Seventhly.* Platinum ought to be ranked in the class of alterative remedies, by the side of gold, iodine and arsenic. It differs from mercury in previously inducing excitement; whilst its administration is not followed by any of the disagreeable consequences induced by mercury. *Eighthly*, and *lastly.* Platinum is preferable, as an alterative, to mercury and gold.

PLATINI BICHLORIDUM.

SYNONYMES. Platini Perchloridum, Bichloride or Perchloride of Platinum.
French. Bichlorure ou Perchlorure de Platine.

This preparation is made by dissolving *platinum* in *aqua regia*, and evaporating the solution to dryness. A very gentle heat ought to be used; otherwise the bichloride may be decomposed; and the protochloride, or even reduced platinum, be the result.

Bichloride of platinum in concentrated solution or in the solid state is of a deep red colour. It is very deliquescent; very soluble in water, and soluble also in alcohol.

Mistura platini perchloridi.

Mixture of chloride of platinum.

(*Potion platinique.*)

℞. Platin. perchlorid. sicc. gr. iss.
 Mucilag. acac.
 Aquæ, āā. f. ℥iij.

To be taken by table-spoonfuls in the course of the 24 hours.

Pilulæ platini perchloridi.

*Pills of perchloride of platinum.**(Pilules platiniques.)*

- R. Platin. perchlorid. gr. viij.
Guaiaac. resin. ℥i.
Glycyrrhiz. pulv. q. s. ut fiant pil. xx.

Dose. — One, two, three, or four, morning and evening.

Unguentum platini perchloridi.

*Ointment of perchloride of platinum.**(Pommade platinique.)*

- R. Platin. perchlorid. gr. xv.
Extract. belladon. ℥ss.
Adipis, ℥i.

To be applied to *indolent ulcers*.

SODII CHLOROPLATINAS.

SYNONYMES. Chloroplatinate of Sodium, Double Chloride of Platinum and Sodium.

French. Chloroplatinate de Sodium, Chlorure Double de Platine et de Sodium.

The chloroplatinate of sodium is prepared by dissolving *bichloride of platinum* and very pure *chloride of sodium* in proper proportions in *water*, evaporating and crystallizing. It is soluble in water and in alcohol, and crystallizes in beautiful transparent prisms of an intensely yellow colour.

Mistura sodii chloroplatinatis.

*Mixture of chloroplatinate of sodium.**(Potion de chloroplatinate de sodium.)*

- R. Platin. perchlorid. gr. v.
 Sodii chlorid. pur. gr. viij.
 Mucilag. acac.
 Aquæ, aa. f. ʒiij.

To be taken by spoonfuls in the 24 hours.

Injectio sodii chloroplatinatis.

*Injection of chloroplatinate of sodium.**(Injection de chloroplatinate de sodium.)*

- R. Sodii chloroplatinat. crystalliz. ʒss.
 Decoct. papaveris, Oss.

The experiments of M. Höfer with the salts of platinum have not been numerous; but they confirm the assertion of Magendie, that they possess properties analogous to those of the salts of gold.

CXIV. PLUMBI IODIDUM.

SYNONYMES. Plumbi Ioduretum seu Iodetum, P. Hydriodas, P. Iodhydras, Plumbum Iodatum, P. Hydroiodicum, Iodide or Ioduret of Lead.

French. Iodure de Plomb.

German. Bleiiodid, Iodblei, Bleiiodüre, Einfach Iodblei, Hydriodsaures oder Iodwasserstoffsäures Blei.

MODE OF PREPARING.

This preparation may be made by adding a solution of one hundred parts of *iodide of potassium* to a solution of seventy-five parts of *acetate of lead*.

The London Pharmacopœia of 1836, gives the following form : — Take of *Acetate of lead*, nine ounces ; *Iodide of potassium*, seven ounces ; *Distilled water*, a gallon (imperial measure) : dissolve the acetate of lead in six pints of the water, and filter ; and to these add the iodide of potassium, previously dissolved in two pints of the water : wash the precipitate and dry it.

In the Edinburgh Pharmacopœia, it is directed to be prepared by the double decomposition of *nitrate of lead* and *iodide of potassium*. Dr. Christison* considers, that the nitrate is preferable to the acetate of lead, as being more uniform in composition, and free from any excess of oxide of lead, which interferes with the purity of the product.

Iodide of lead is in the form of a bright yellow colour, and, according to Soubeiran,† is soluble in 1235 parts of cold water ; and is somewhat more soluble in boiling water, which, on cooling, deposits the iodide in minute, shining, yellow, crystalline scales. Riecke‡ says it is soluble in 1200 parts of cold water, and in 200 of hot. When heated, it melts, and is dissipated in vapours, which are at first yellow, and afterwards violet.

EFFECTS ON THE ECONOMY.

Iodide of lead is not an irritant, when applied even to a denuded surface.§ M. Paton|| administered twelve grains of it to a cat of moderate size. In four hours the animal did not appear to experience any inconvenience ; twelve more grains were then given ; in twelve hours, the animal became uneasy, and constantly refused every kind of food. It appeared to suffer in the kidneys ; subsequently, it was attacked with violent colic, which caused it to jump to great heights. Three days after taking the iodide, it died, suffering dreadfully. The dissection was made twelve hours afterwards, when no traces of irritation were perceptible. M. Paton examined the exterior of the stomach chemically, but was unable to detect any of the iodide, nor could any portion of it be discovered in the fæces. He then boiled the intestines and their contained matters in distilled water ; the liquid was filtered and decolourised by charcoal, but no effect was induced by the tests for lead. The matter remaining on

* Dispensatory, p. 711. Edinburgh, 1842.

† *Traité de Pharmacie* ; and Dr. Wood, in *Dispensatory of the United States of America*, by Drs. Wood and Bache, 4th edit. p. 998. Philad. 1839.

‡ *Die neuern Arzneimittel*, u. s. w. 2te Auflage, S. 563. Stuttgart, 1840.

§ Eager, in *Dublin Journal* for 1834.

|| *British Annals of Medicine*, Mar. 3, 1837 ; and *Journal de Chimie Médicale*, Jan. 1837.

the filter was digested in dilute nitric acid : the solution was filtered, and a precipitate obtained on pouring in a solution of chromate of potassa. The liquid was evaporated ; the residue calcined along with what was left by the evaporation of the water, and the whole brought in contact with dilute nitric acid. Nitrous gas was disengaged, and the solution responded to reagents like the solutions of the salts of lead. M. Paton infers, that iodide of lead introduced into the stomach is partly absorbed, and that it is this portion which causes death,—the remainder passing into the intestines, and admitting of detection by the method described.

When given internally, in the dose of a quarter or half a grain, Velpeau thought, that it occasioned, in one instance, irritation in the alimentary canal ; but Dr. O'Shaughnessy thinks that this result must have been owing to idiosyncrasy, as ten-grain doses can be borne with perfect impunity. The experiments of Dr. Cogswell* show, that it is by no means an active agent, and that its physiological operations do not correspond with its therapeutical effects ; as, in continued doses, it produced the constitutional action of lead, and not at all that of iodine.

Owing to its not exciting cutaneous irritation—like iodine, and iodide of potassium—iodide of lead has been applied externally. Velpeaut treated three cases of *enlarged glands* with very gratifying success, although the patients had used frictions with other preparations of iodine ineffectually. Similar good effects were observed by Guersent, Roots, and others. Dr. Christison† has seen it repeatedly useful to appearance in *obstinate ulcers*, especially when “consecutive to mercurio-syphilitic eruptions in strumous habits.”

Pilulæ plumbi iodidi.

Pills of iodide of lead.

R. Plumbi iodid. gr. iv.

Confect. rosæ, ℥j. M. et divide in pilulas xij.

Dose. — One night and morning, in *scrophulous affections of the glands, joints, &c.* The dose may be gradually increased to three or four pills, or more. Joy.§

* Essay on Iodine, p. 142. Edinb. 1837.

† Lugol, Essays on Iodine, &c., by O'Shaughnessy, p. 206.

‡ Dispensatory, p. 712. Edinb. 1843.

§ Tweedie's Library of Medicine, v. 320. Loud. 1840 ; or 2d Amer. Edit. vol. iii. Philad. 1842.

Unguentum plumbi iodidi.

*Ointment of iodide of lead.*R. Plumbi iodid. \mathfrak{z} j.Adipis, \mathfrak{z} viii. M.

Applied to *scrophulous* and *other indolent swellings* in the
form of friction. *Lond. Pharm.*

CXV. PLUMBI TANNAS.

SYNONYMES. Tannate of Lead.

French. Tannate de Plomb.*German.* Gerbstoffblei.

Autenrieth* has strongly recommended tannate of lead in cases of *paratrimma ad decubitum*, that is, of *sores produced by lying*, and its advantages have been confirmed by others.

METHOD OF PREPARING.

Tannate of lead is formed by precipitating an infusion of *oak bark* by *acetate of lead*, according to the following formula : "Take of *oak bark*, in coarse powder, an ounce ; boil in eight ounces of *water*, until, when strained, four ounces remain : add *acetate of lead* as long as any precipitate falls ; filter the liquor through bibulous paper, and dry the precipitate remaining on the paper to the consistence of a thin ointment."

Dr. Tott has recommended it in cases of *decubitus gangrenosus*, or *sloughing sores produced by lying*.† In one case, in which it appeared to be inefficacious, he took two drams of the dried precipitate, mixed it with an ounce of unguentum rosatum, and used this UNGUENTUM PLUMBICO-TANNICUM with success.

* British Annals of Medicine, June 2, 1837 ; and Journ. de Chimie Médicale, Mars, 1837.

† Gräfe und Walther's Journal der Chirurgie, B. xxiv. S. 676, Berlin, 1836 ; and Gazette Médicale, Jan. 1837.

CXVI. POTAS'SÆ CHLORAS.

SYNONYMES. Kali Chloricum, K. Chlorinicum, Chloras Kalicus Depuratus, Chloras Potassicus, Alkali Vegetabile Salito-dephlogisticatum, Chloruretum Potassæ Oxidatum, Haloidum Oxygenatum, Murias Potassæ Hyperoxygenatum seu Oxygenatum, Oxygenochloruretum Potassii, Kali Oxymuriaticum, Kali Muriaticum Hyperoxygenatum, Potassæ Euchloras, Chlorate of Potassa, Chlorate of Protoxide of Potassium, Oxymuriate of Potassa, Hyperoxymuriate of Potassa.

French. Chlorate de Potasse.

German. Chlorsaures Kali, Oxydirt Salzsaures oder Hyperoxygenirt Salzsaures Kali.

METHOD OF PREPARING.

In the chemical manufactories, chlorate of potassa is prepared by passing *chlorine gas* into a solution of *carbonate of potassa*. In this way, chlorate of potassa is obtained mixed with more or less chloride of potassium. The salt prepared in the laboratories, before it is adapted to medical use, should be purified by recrystallisation. It is to be observed, that when the adequate quantity of chlorine gas is not employed in the preparation, the resulting compound is analogous to chlorinated soda and chlorinated lime, and in action it agrees rather with those preparations than with the true chlorate of potassa. This may tend to explain the discrepancy in the experience of different physicians.

Chlorate of potassa crystallises in white leaves, having the splendour of mother-of-pearl, or in four or six-sided tables, having a specific gravity of 1.989. It is permanent in the air, and has a cool, saline, disagreeable taste, similar to that of saltpetre. Six parts are soluble, at the ordinary temperature, in 100 parts of water. When exposed to heat, oxygen escapes, and chloride of sodium remains. When beaten forcibly in a mortar, it crackles, and emits light, and sparks. When rubbed lightly with inflammable substances, or when struck, it inflames readily, and hence its well known employment in the formation of matches.

EFFECTS ON THE ECONOMY.

These have not been completely tested, in the opinion of some at least.* L. W. Sachs, who has frequently administered it, is of opinion, that in this salt the direct effect of the alkali is rendered milder by the chloric acid, whilst the alkali modifies that of the

* Riecke, Die neuern Arzneimittel, S. 300, und 2te Auflage, S. 451. Stuttgart, 1840.

acid; in this manner, the caustic property of the alkali is destroyed; whilst the liquifying or resolvent (*fluidisirende*) property is moderated, but not removed. On the other hand, by the union of the chloric acid with the alkali, the powerful excitant action on the nerves, which the former exerts, is at the same time markedly moderated, although certainly not destroyed; the mode in which it is exerted, he thinks, is probably changed. By such a union, a medicine has been supposed to be formed, which acts chiefly on the nervous system, and which is capable of mitigating and probably of removing any morbid erethism therein, with the hyperæsthesia thereby induced.

Such is the opinion of certain therapeutists. Others imagine, that it is capable of purifying the mass of blood in consequence of the chlorine it contains; but a salt of chloric acid is not possessed of the same properties as chlorine; and, accordingly, when the author has found occasion to administer it, he has never witnessed any of the effects ascribed to it; nor has he seen any evidence of the *modus operandi* on the nervous system mentioned above, or of its imparting oxygen to the blood as supposed by some.* The saline powder given below, which was considered by Dr. Stevens to be so useful in many febrile affections, is affirmed by Mr. Braithwaite† to have been very beneficial in *typhous cases*, marked by dry, parched, brown or black tongue; dark sordes on the teeth and gums, &c., &c. In almost every case, he found the dark appearances in the mouth to be altered in an incredibly short time.

From its excitant properties, and under the notion that it may act upon the blood, and through the blood on the functions of nutrition as an excellent alternative, chlorate of potassa has been recommended in *chronic cutaneous diseases* in general, as well as in *hepatic* and *syphilitic affections*. It has also been occasionally administered in cases of *chronic asthenia*.

Köhler‡ employed it in several cases of *tubercular phthisis*, and notwithstanding the general results of his experiments were unfavourable, he thinks it ought to be admitted into the number of those remedies that are useful in phthisis, although its stimulating action on the circulating and pulmonary systems cannot be denied. Its use is contraindicated where the fever runs high, and where there is any sign of inflammation of the lungs, or tendency to hæmoptysis. Dr. Christison§ states, that he has tried the effects of seven-grain doses three times a day in phthisis,

* See Stevens on the Blood, p. 296. London, 1832; and Pereira, Elements of Mat. Med. and Therap. 2d. edit. i. 514, Lond. 1842; or Amer. edit. by Dr. Carson, Philad. 1843.

† Retrospect of Practical Medicine and Surgery, July to December, 1840, p. 275.

‡ Rust's Magazin, B. xlvi.

§ Dispensatory, p. 739. Edinb. 1842.

but could not observe any physiological or therapeutical action whatever.

Sachs, in accordance with the views before mentioned, in regard to its antineuropathic properties, has advised it in cases of *prosopalgia*. He affirms, that, in a great many instances, it afforded essential relief. Chisholm appears to have been one of the earliest to prescribe it in *neuralgia faciei*; and, after him, Herber, and subsequently, B. Schäffer, Jos. Frank, Meyer, and others, employed it both as a curative and palliative agent in that disease. It has likewise been advised in obstinate *rheumatism of the nervous kind*, by Knod von Helmenstreit; and Eyr has extolled it in *ulceration of the mouth after violent salivation*.

MODE OF ADMINISTERING.

Sachs prescribed it in the dose of from three to six grains, three or four times a day, but some give it in much larger quantity. It may be administered either in the form of powder or of solution.

It would appear, as Dr. Pereira has properly remarked,* that most of the uses of this salt have been founded on certain views of chemical pathology, some of which are now considered untenable. It passes through the kidneys unchanged, and consequently the notion, that it furnishes oxygen to the system must be discarded. From the results of the author's numerous trials with it, he is disposed to accord with Dr. Christison,† that no evidence has yet been published of such a nature as to entitle it to admission into the Pharmacopœias: yet it is officinal in the London Pharmacopœia.

Pulves potassæ chloratis compositus.

Compound powder of chlorate of potassa.

(*Stevens's Saline Powder.*)

R. Potassæ chlorat. gr. viij.
Sodii chlorid. gr. xx.
Sodæ bicarbonat. gr. xxx. M.

One of these to be given every two or three hours in low febrile cases.

Stevens.

* Ibid, p. 514.

† Ibid. p. 738, Edinb. 1842.

Liquor potassæ chloratis.

*Solution of chlorate of potassa.**Solutio Murialis Potassæ Oxygenati, Liquor ad Ulcera Atonica.*

R. Potassæ chlorat. ℥j.
 Aquæ destillat. f.℥xij. M.

To be applied to *indolent ulcers*, by means of lint dipped in it, or of a camel's hair pencil, to excite the tissues.

*Swediaur.**

Potus potassæ chloratis.

*Drink of chlorate of potassa.**(Potus oxygenatus.—French. Tisane oxygénée.)*

R. Liquor. potass. chlorat. Oij.
 Aquæ, Oiv. M.

Given internally, in cases of *general asthenia*.

Dose. — One or two pints a day.

Swediaur.

Mistura potassix chloratis.

Mixture of chlorate of potassa.

R. Potassæ chlorat. ℥iss.
 Aquæ destill. f.℥iv.

Solve.

Dose. — A spoonful, every two hours.

Von Helmenstreit.

Eyr dissolves twenty-five grains of the *chlorate* in four fluid ounces of *distilled water*, and administers a spoonful three times a day.

R. Potass. chlorat. ℥j.
 Aquæ destillat. f.℥iv.
 Syrup althææ, f.℥j. M.

Dose. — A table-spoonful, four times a day.

Köhler.

* Pharm. Med. Pract., Bruxelles, 1817, 2d edit.

CXVII. POTASSII BROMIDUM.

SYNONYMES. Kalium Bromatum, Bromuretum Potassicum, B. seu Brometum Kalii, B. Potassii, Bromide of Potassium. In Solution, Hydrobromate of Potassa, Potassæ Hydrobromas, Kali Hydrobromicum, Bromhydras Potassæ.

French. Bromure de Potasse.

German. Bromkalium, Kaliumbromid, Kaliumbromüre, Bromwasserstoffsaures oder Hydrobromsaures Kali.

METHOD OF PREPARING.

According to Liebig, this preparation can be readily made by dissolving *bromine* in *alcohol*, and adding *caustic alkali* until the spirit begins to change colour, then evaporating and heating to redness. In the London Pharmacopœia, it is directed to be made by adding first an ounce of *iron filings*, and afterwards two ounces of *bromine* to a pint and a half of *distilled water*. The mixture is set aside for half an hour, and frequently stirred with a spatula: a gentle heat is then applied, and when a greenish colour is produced, two ounces and a dram of *carbonate of potassa*, dissolved in a pint and a half of *water*, are poured in: what remains is filtered and washed with two pints of *boiling distilled water*, and again filtered. The mixed solutions are then evaporated, that crystals may form.

Liebig says it crystallises in four-sided shining tables: according to Balard,* commonly in tubes, and at times in long rectangular parallelopipedons. It has a pungent taste like that of common salt but more acrid; and is devoid of odour. By heat, it crepitates, and melts into a red hot flux, without experiencing change. It is more soluble in hot than in cold water; producing, during its solution, evident cold, and becoming converted into hydrobromate of potassa. It is also soluble in alcohol, although in small quantity. The solution of bromide of potassium dissolves no more bromine than pure water.

EFFECTS ON THE ECONOMY.

Bromide of potassium excites the same phenomena as bromine, but with less intensity. From a dram and a half to two drams is needed to kill a dog. The animal appears to suffer; is restless,

* Annales de Chimie, tom. xxxii.

and gradually falls into a state of prostration. In smaller doses, it appears to act powerfully on the human stomach. The bromide, like bromine, seems first to have been applied to therapeutical purposes by Pourché.* Two cases of *scrophulous tumours* are reported by him to have been removed by friction with an ointment composed thereof, and a cataplasm sprinkled with an aqueous solution. In a third patient, *chronic otorrhæa* and *scrophulous tumefaction of the testicle* yielded to the same agency, combined with the internal use of bromine. A very large *goître* was reduced two-thirds by it.

Pourché prescribed the bromide internally in the form of pill, in the dose of four to eight grains in the day.

Magendie† employed the preparations of bromine in *scrophula*, in *amenorrhæa*, and in *hypertrophy of the ventricles of the heart*. Prieger recommended an ointment of "*Kali bromicum*" in inveterate *porrigofavosa* as well as in *obstinate and malignant tetter*, and with good success; and Dr. Williams‡ in cases of *enlarged spleen*. The last gentleman suggests, that it possesses "unusual, if not specific (?) powers in the cure of diseases of the spleen." It was owing to these results that the bromide was introduced into the London Pharmacopœia, of 1836.§ Dr. Williams also gave it with success in a case of *ascites*.

MODE OF ADMINISTERING.

Liquor potassii bromidi.

Solution of bromide of potassium.

R. Potassii bromidi, gr. vi.—viiij.—x.
 Aquæ lactucæ, f.ʒiij.
 Syrup althææ, f.ʒi. M.

To be given in the course of the twenty-four hours, in tablespoonfuls.

Magendie.

* Journ. de Chimie Médicale, iv. 594; see, also, Bulletin Général de Thérapeutique, No. 14, Juillet 30, 1837.

† Formulaire, Ed. cit.

‡ Elements of Medicine, i. 338.

§ Pereira, Elements of Materia Medica and Therap. 2d edit. i. p. 499, Philad. 1842; or Amer. edit. by Dr. Carson, Philad. 1843; and Brande's Dict. of Mat. Med. p. 126. Lond. 1839.

Unguentum potassii bromidi.

Ointment of bromide of potassium.

℞. Adipis, ʒj.

Potass. bromid. gr. xxxiv. M.

From half a dram to a dram to be rubbed on *scrophulous swellings.* *Magendie.*

M. Pourché employs ʒj. of the *bromide* to the ounce of *lard*.

℞. Axung. ʒj.

Potassii bromid. gr. xxiv.

Bromini liquid. gr. vi. ad xij. M.

Magendie.

CXVIII. POTASSII CYANURETUM.

SYNONYMES. Potassii Cyanidum, Kali Hydrocyanicum, Kalium Cyanogenatum, Cyanuretum Potassicum seu Kalii, Cyanidum Kalii, Cyanetum Kalii, Hydrocyanas seu Cyanhydras Potassæ seu Kalicus, Cyanide or Cyanuret of Potassium.

French. Cyanure de Potassium.

German. Cyankalium, Blaustoffkalium, Kaliumcyanüre, Hydrocyansaures Kali.

This preparation was proposed by MM. Robiquet and Viller-mé,* as a substitute for hydrocyanic acid. It is, in their opinion, far more certain in its effects than that preparation.

METHOD OF PREPARING.

Cyanuret of potassium is formed whenever *potassa* is calcined with an *animal matter*, as in the preparation of the Prussian blue. It is commonly prepared, after the process of Robiquet, by exposing to long continued heat the ferruginous prussiate of potassa. The cyanuret of iron is completely decomposed, and that of the potassium remains. The residuum, after this strong calcination, constitutes a solid, blackish mass, which consists wholly of cyanuret of potassium, soiled by the iron and the charcoal belonging to the cyanuret of iron. The mass is dissolved in water, when the iron and charcoal are deposited; whilst the

* Bulletin de la Société Médicale d'Emulation, Juillet, 1823. See, also, Dr. James Hamilton and Mr. Thos. G. Mackenzie, in the Maryland Medical and Surgical Journal, Apl. 1840, p. 201.

cyanuret of potassium dissolves, and is transformed into hydrocyanate of potassa. When the process has been well conducted, the solution is perfectly colourless, and retains no portion of iron.

M. Chevallier* considers this process to be impracticable, as the cyanuret decomposes water on coming in contact with it. The result, therefore, must be hydrocyanate of potassa; and, on heating this, all the hydrocyanic acid escapes, and the residue is merely potassa. He prepares the salt by calcining *ferrocyanuret of potassium*, and then separating the cyanuret from the quadricarburet of iron by pure *alcohol*: on distilling this, the cyanuret is obtained very pure.

Dr. Hamilton and Mr. Mackenzie, of Baltimore,† recommend the following process as most convenient and simple: — Expose, — say four ounces of the dried *ferrocyanuret of potassium* in a common Hessian crucible to a red heat, until nitrogen ceases to pass over; (this generally takes from one and a half to two hours;) then, breaking the crucible, powder the black mass quickly, and add — say sixteen fluid ounces of *alcohol*, stirring the mixture repeatedly, until it acquires the temperature of about 150° Fahr.; then filter, and evaporate by a sand or water bath regulated so as to be below the boiling point of alcohol; for if heated above this temperature, oil of wine is formed, which is gradually decomposed during the process, and carbon is deposited, which blackens the mixture. The evaporation should be carried on so as to have as great an extent of surface exposed as possible. The ferrocyanuret will be found to have yielded six or seven drams of the cyanuret, which is dry, inodorous and perfectly white.

The following process is directed in the last edition of the Pharmacopœia of the United States (1842):—Take of *ferrocyanuret of potassium*, in powder, ℥viii.; *Distilled water*, f.℥vj. Expose the ferrocyanuret to a moderate heat until it becomes nearly white, and is wholly deprived of its water of crystallization. Put the residue in an earthen retort, with the beak loosely stopped, and expose it to a red heat for two hours, or till gas ceases to be disengaged. Withdraw the retort from the fire, close the orifice with lute, and then let the whole remain until quite cold. Break the retort, remove the black mass, reduce it to coarse powder, introduce into a bottle of the capacity of twelve fluid ounces, and then add the distilled water. Agitate the mixture occasionally for half an hour, throw it on a filter, evaporate the filtered solution rapidly to dryness, and keep the dry mass in a closely stopped bottle.

* Journ. de Chimie Médicale, and Journal of Phila. College of Pharmacy, 1832.

† Op. cit. p. 203.

Pure cyanuret of potassium is white and transparent: it may be fused in the fire without being decomposed, and keeps for an indefinite period, provided it be preserved dry. It is very soluble in water, but sparingly so in alcohol. All acids decompose it, even the carbonic: hence the solution, when exposed to the air, emits the smell of hydrocyanic acid; and carbonate of potassa is formed, in the place of the hydrocyanate of potassa. It has a sharp, somewhat alkaline, and bitter almond taste, and an alkaline reaction. Its solution, when exposed to the air, exhales the odour of cyanohydric acid.

EFFECTS ON THE ECONOMY.

MM. Robiquet and Villermé performed some experiments on animals in the presence of Magendie.* A tenth of a grain destroyed a male linnæ in a minute; less than a grain killed a guinea-pig in two or three minutes: a small drop of the hydrocyanate of potassa, containing only the hundredth part of a grain of the cyanuret in solution, caused a linnæ to drop down dead in half a minute. Half a dram containing five grains of the cyanuret, killed a dog of large size in a quarter of an hour.

Magendie proposes, that the cyanuret of potassium should be dissolved in eight times its weight of distilled water, when it becomes transformed into hydrocyanate of potassa. To this solution, he gives the name *medicinal hydrocyanate of potassa*, and advises that it should be given under the same circumstances, and in the same doses, as the *medicinal hydrocyanic acid* (see page 19 and 29). He farther suggests, that to render it wholly independent of the action of the small portion of alkali contained in the cyanuret, a few drops of some vegetable acid may be added, or it may be prescribed with an acid syrup.

The dose of the cyanuret is a quarter of a grain at first, gradually increased to a grain and more. M. Bally gave it to fifty-two individuals labouring under different diseases; it produced no effect on thirty-five; and, on the others, the result was neither constant nor salutary, so that he is not inclined to place more reliance upon the cyanuret than upon the hydrocyanic acid.

By Dr. Lombard,† of Geneva, it has been applied externally, with success, in some cases of *facial neuralgia*. He uses it by friction, in the form of watery solution, or of ointment, according to circumstances. The watery solution is in the strength of from one to four grains to the ounce of water; and the ointment is composed of from two to four grains of the cyanuret to an ounce

* Formulaire pour la Préparation, &c. de plusieurs Nouveaux Médicaments, &c.

† Gazette des Hôpitaux, and Lond. Med. Gaz. Sept. 1831.

of lard. The aqueous solution, however, is considered by Dr. Lombard to be the most prompt in its effects. He regards the cyanuret to be contraindicated, where the nervous affection is complicated with inflammatory action. He has found it a useful remedy, also, in *chronic rheumatism*. In *sciatic neuralgia*, it was not successful. In *white swelling*, attended with acute pains, poultices moistened with the solution, gave great relief. Dr. Lombard, indeed, affirms, that the soothing properties of the cyanuret are superior to those of any remedy known. Lotions of hydrocyanic acid are not to be compared with it,—the acid being decomposed with facility, and not devoid of danger.

In a case of *acute rheumatism*, attacking the articulations of a chlorotic young female, M. Malherbe,* after leeching, applied compresses over the joints affected, moistened with a solution of the cyanuret—ten grains to the ounce of distilled water. In forty-eight hours, the pains ceased. It is probable, however, that much of the good effect was owing to the compression.

MM. Trousseau and Rulliert† also recommend the cyanuret, in the proportion of four grains to an ounce of water, as a local application in various forms of *neuralgia*.

M. Andral‡ employed it with complete success in a case of *intense cephalalgia*, which, for ten months, had resisted the most powerful remedies, as bleeding, a seton in the neck, blisters and sinapisms. It was used in solution, in the proportion of from six to eight grains to the ounce of distilled water; and compresses, wet with the solution, were applied, for eight days, to the forehead and temples.

MODE OF ADMINISTERING.

Mistura potassii cyanureti.

Mixture of cyanuret of potassium.

Mixture of hydrocyanate of potassa.

Pectoral Mixture, of Magendie.

R. Potass. hydrocyan. med. f.ʒi.
Aquæ destillat. Oj.
Sacchar. ʒiiss. M.

Dose.—About five drams (a table-spoonful), night and morning.

* Journal des Connaissances Médico-Chirurgicales.

† Lond. Med. and Surg. Journ. Dec. 15, 1832; and Amer. Journ. of the Med. Sciences, May, 1833, p. 238.

‡ Gazette Médicale, Jan. 1832.

(Pectoral potion.)

R. Potass. hydrocyan. med. gtt. xv.
 Infus. heder. terrestr. f.℥ij.
 Syrup. althææ, f.℥j. M.

Dose. — Five *grammes* (a tea-spoonful) every three hours.
Magendie.

R. Potassi cyanur. gr. $\frac{1}{2}$.
 Aquæ lactucæ, f.℥ij.
 Syrup. althææ, f.℥j. M.

Dose. — Five drams (a table-spoonful) every two hours.
Magendie.

R. Tinct. castor.
 Moschi,
 Potassæ nitrat. āā. gr. iv.
 Potassii cyanuret. gr. ij.
 Aquæ flor. tiliæ, seu
 Aquæ cinnamom. f.℥viij.

To be taken in the course of the twenty-four hours, in *chorea*.
Fouquier.

Syrupus potassii cyanureti.

Syrup of cyanuret of potassium.

R. Potass. hydrocyanat. medic. f.℥j.
 Syrupi, Oi.

This syrup may be added to pectoral draughts, and may be substituted for other syrups.

Pilulæ potassii cyanureti.

Pills of cyanuret of potassium.

R. Potassii cyanur.
 Amyli, āā. gr. iv.
 Syrup. q. s. ut fiat massa in pilulas viij. dividenda.

Dose. — A pill, night and morning, in *convulsions, dyspnœa*, &c.
*Hospital of La Pitié.**

* Ryan's Formulary, 3d edit. p. 392. Lond. 1839.

Lotio potassii cyanureti.

Lotion of cyanuret of potassium.

R. Potass. cyanuret. gr. xij.

Mist. amygdal. f. ʒvj. M.

To be used in *lichen*, and other *chronic eruptions*, attended
with much *itching*. *Louis.*

R. Potass. cyanur. gr. vj.

Solve in

Aquæ destillat. f. ʒj. M.

Compresses to be wetted with this and applied in cases of
neuralgia faciei, *hemicrania*, &c.

*Recamier, Trousseau, Blouquier.**

Unguentum potassii cyanureti.

Ointment of cyanuret of potassium.

R. Potass. cyanur. gr. ij. — iv.

Adipis, ʒi. M.

The size of a hazelnut to be rubbed in, in cases of *neuralgia*.
Lombard.

CXIX. POTASSII IODIDUM.

SYNONYMES. Kalium Iodatum, Iodidum Kalii, Kali Hydroiodinicum, K. Hydroiodicum, Hydroiodas Kalicus, H. Lixiviæ, Ioduretum Potassicum, Iodhydras Kalicus seu Potassæ, Potassii Ioduretum, Iodide or Ioduret of Potassium. In solution — Potassæ Hydriodas, Potassii Proto-hydriodas, Potassii Protoxidi Hydriodas, Hydroiodas Kalicus, H. Lixiviæ, Iodhydras Kalicus seu Potassæ, Hydriodate of Potassa.

French. Hydriodate de Potasse, Iodure de Potasse.

German. Iodkalium, Iodwasserstoffsäures Kali, Kaliumiodüre, Iodinwasserstoff Kali, Hydriodsaures oder Hydriodinsaures Kali, Kalihydroiodat.

METHOD OF PREPARING.

According to Tünnermann, iodide of potassium is best prepared in the following manner:

One part of *pure iron filings*, with four parts of *iodine*, is put

* Lincke, Vollständiges Recept-Taschenbuch, ii. 91. Leipz. 1841.

into a glass vessel — by many, into a glass retort — and six or eight parts of *water* are poured thereon ; gentle warmth is then applied, and the mixture is frequently shaken until the liquid appears clear and almost colourless. In this way, hydriodate of protoxide of iron is formed, which is dissolved in the water. It is now filtered ; the residuum washed several times on the filter with distilled water, and under the application of a moderate heat, a concentrated solution of *potassa* is added, by small portions at a time, until a precipitate is no longer thrown down. In this process, the potassium separates the iodine from the hydriodic acid ; the oxygen of the former unites with the hydrogen of the latter ; protoxide of iron is precipitated, and carbonic acid given off, — heat being required for its entire disengagement, to prevent the formation of a carbonate of protoxide of iron with excess of acid, which would be soluble in the water. It is then filtered, the residue washed on the filter with distilled water, and the liquid evaporated so as to form crystals.

Those chemists or *pharmaciens*, who are not very accurate in their preparations, evaporate the mother waters to dryness, satisfying themselves, that although the saline residuum contains carbonated alkali, it may answer for external use ; which is decidedly objectionable. To prevent the loss of the iodide, owing to its admixture with any carbonate of potassa, in the mother waters, Tünnermann finds it most advantageous to neutralise it with the HYDRIODIC ACID, which may be prepared in the following manner : Dissolve about one dram of *iodine* in not very strong *alcohol*, and pass a stream of *sulphuretted hydrogen* into the solution, until it is wholly deprived of colour. The hydrogen unites with the iodine, — the hydriodic acid, thus formed, remaining dissolved, whilst the sulphur is precipitated. The liquor is then filtered, the sulphur washed with a little *water*, and the spirit and superfluous sulphuretted hydrogen gas are driven off by heating in a glass vessel placed in a sand bath. The remaining fluid is diluted with *water*, filtered, and a warm *alkaline ley* added until litmus paper is only feebly reddened. By evaporation iodide of potassium is obtained, which, by repeated solution in water, evaporation of the solution, and filtration, is obtained entirely pure.*

The process of Turner is, to take any quantity of the solution of *caustic potassa*, and to add to it gradually, at a gentle heat, *iodine* sufficient to neutralise the alkali ; then evaporating to dryness, calcining strongly, dissolving in water, and crystallising.†

* Riecke, Die neuern Arzneimittel, S. 305. Stuttgart, 1837.

† Bache, in Wood and Bache's Dispensatory of the United States, 4th edit. p. 1018, Philad. 1839.

Dr. William Gregory* suggested an improvement on the process of Turner, which has been regarded as one of the simplest.† It consists in adding *iodine* to a hot solution of *potassa* until the fluid assumes a yellowish-brown colour, then evaporating, and heating the residuum to low redness, in a platinum crucible. The mass, which at first consists of iodide of potassium and iodate of potassa, thus loses all its oxygen, and becomes converted into iodide of potassium.

The formula of Caillot and Baup is — to take ten parts of *iodine* and fifty of *distilled water*; put them into a matrass, and add, in small successive portions, of pure *iron filings*, five parts, — shaking the vessel each time. The liquor is then heated until it loses its colour, filtered, and the substance on the filter washed with boiling water, until the liquid is tasteless; the liquor, and the various liquids used in the washings, are united, and the whole is heated in a sand bath. When the temperature approaches that of ebullition, enough of a solution of *carbonate of potassa* is added, to precipitate all the oxide of iron; it is then filtered, and the substance on the filter washed until it is completely exhausted. All the liquors are then united, tested by reddened litmus paper, and if there be any excess of base, a little *hydriodic acid* is added. It is then evaporated in a sand bath, until a slight pellicle forms; the fire is now discontinued, and the salt is suffered to crystallise. Lastly, the crystals are washed with a little *water*, and dried.‡

Iodide of potassium is in white or transparent crystals. These are readily fused, and are volatilised at a red heat. They do not decompose, even when heated with access of air. They are readily soluble in water, and in alcohol, and the addition of the iodide facilitates greatly the solution of the iodine.

It would seem, that a slight contamination of iodide of potassium with carbonate of potassa is exceedingly common, as it can with difficulty be avoided in the manufacture of the salt; but Dr. Christison§ affirms, that he has examined specimens, where the carbonate, with its accompanying water, amounted to 90 parts in the 100. “Can we wonder, then,” he asks, “that practitioners should complain of the iodide of potassium, that they have given it for months, nay, even for years, without observing any effect

* Edinb. Med. and Surg. Journ., xxxvi. 369, for Oct. 1831.

† Cogswell, on Iodine, p. 85.

‡ Jourdan's Pharmacopée Universelle, i. 662. Paris, 1828; also the Lond. Pharmacopœia, and Brande's Dictionary of Materia Medica, p. 317. Lond. 1839. 'This is essentially the process of the Pharmacopœia of the United States (1842).

§ Edinb. Med. and Surg. Journal, April, 1838; and Dispensatory, p. 753, Edinb. 1842; also, Pereira, Elem. Mat. Med. and Therap. 2d. edit. i. 491, Lond. 1842; or Amer. edit. by Dr. Carson, Philad. 1842.

either on the constitution, or on the disease for which it was administered?"

EFFECTS ON THE ECONOMY.

As respects the action of iodide of potassium, and its administration in disease, it is scarcely necessary to do more than refer to what has been said under the head of iodine. On the whole, its effects appear to accord with those of iodine; at least, no difference is perceptible on the organism. It has been supposed, that it is better than pure iodine, where the object is to act especially on the urinary organs.* For external use, iodide of potassium is usually preferred to iodine. It is constantly given internally, and often in combination with the latter; the solubility of which, as was before remarked, is aided by it. Many of the subjoined formulæ contain both one and the other. As remarked under Iodine, it is now administered in very large doses in a multitude of diseases of different nature, and often, doubtless, where it can render little or no service.

Dr. Buchanan asserts, that he has given it in doses of ʒss. , and the only precaution he observed was to make the patient drink freely of diluents. It was chiefly to determine some physiological questions that he administered it in such large doses. Two drams of it were taken by a young man affected with gonorrhœa, and as soon as the medicine made its appearance in the urine, blood was drawn from the arm. On examining the blood, both the serum and crassamentum were found deeply impregnated with iodine.† On the other hand, Dr. Lawrie, of Glasgow,‡ considers it very uncertain and at times dangerous, although he esteems it by far the best of the recent remedies, and prescribes it more frequently than any other medicine; and Mr. Mayo§ affirms, that no medicine, where it does good, produces amendment, in constitutional syphilis, so speedily as it. Lugol and others appear to have used it mainly as a solvent to iodine, and he considers it inferior to the latter as a therapeutical agent; but no chemical or other prepossession can set aside the testimony just cited; or that of such observers as Ricord,|| C. J. B. Williams,¶ Joy, and a host of others. In the Author's hands, it has

* Riecke, *Die neuern Arzneimittel*, u. s. w. S. 306. See, also, Cogswell on Iodine, p. 96.

† London Med. Gaz. July 2, 1836.

‡ Lond. Med. Gaz. July 3, 1840, p. 591.

§ A Treatise on Syphilis, by Herbert Mayo, F.R.S. Lond. 1840.

|| Practical Treatise on Venereal Diseases, translated by Drummond, Amer. Edit. Philad. 1843. Parker, *Modern Treatment of Syphilitic Diseases*, Dunglison's Amer. Med. Lib. Edit. p. 77, Philad. 1840; and *Bulletin Général de Thérap.* Juillet, 1840.

¶ Lectures on the Physiology and Diseases of the Chest, Bell's Med. Library Edit. p. 246. Philadelphia, 1839.

appeared to afford as much benefit as any of the preparations of iodine. For the testimony in regard to its beneficial and injurious effects, see IODINE, page 371.

Cases of *salivation* from its use has been published by Sir Francis W. Smith.*

According to recent experiments of Magendie,† iodide of potassium is one of the substances that promote the coagulation of the blood.

METHOD OF ADMINISTERING.

Liquor potassii iodidi.

Solution of iodide of potassium.

Potio resolvens ex Iodio, Solution de Coindet, Coindet's Solution.

R. Potassii iodidi, gr. xxxvj.
Aquæ destillat, f.℥j. Solve.

Dose. — Same as that of the tincture of iodine.
Coindet and Magendie.

R. Potassii iodidi, ℥j.
Aquæ destillat. f.℥j. Solve.

Dose. — Fifteen drops three times a day, gradually increased to forty-five: in cases of *ovarian dropsy*,— frictions with iodine ointment being used at the same time. *Elliotson.*

Liquor potassii iodidi compositus.

Compound solution of iodide of potassium.

(Lugol's Solution.)

R. Iodin. ℥j.
Potassii iodid. ℥ij.
Aq. destillat. f.℥vij. Solve.

Dr. Bache‡ remarks, that "in the original it is *seven ounces*, but from the context of the author, this is evidently a misprint for *seven*

* Dublin Journal of Medical Science, July, 1840, and Jan. 1841.

† Leçons sur le Sang; and Translation in Lancet, for Jan. 26, 1839, p. 636.

‡ Dispensatory of the United States, 4th edit. p. 374, Philad. 1839.

drachms.” It is proper, however, to observe, that many of the successful cases were treated by the weaker solution.

Dose. — Six drops early in the morning, and in the middle of the day, in a glass of sugared water. In *tetter, scirrhus, &c.*
Lugol.

Lugol has a solution of three strengths for internal use :

	I.	II.	III.
R. Iodin.	gr. $\frac{3}{4}$	gr. i.	gr. 1 $\frac{1}{2}$.
Potass. iodid.	gr. iss.	gr. ii.	gr. iiss.
Aq. destillat.	f. $\frac{3}{4}$ viij.	f. $\frac{3}{4}$ viij.	f. $\frac{3}{4}$ viij.

Dose. — Two-thirds, daily, at first ; afterwards, the whole.

Lugol recommends this threefold solution in the same cases as his threefold solution of iodine ; the *first* being continued from fourteen days to three weeks ; the *second*, from the fourth or fifth week of the treatment to its termination ; the *third*, the strongest, he did not often use. As Riecke has observed, it would be better to have in the hospitals but one solution, which might be prescribed in varied doses.

R. Iodin. gr. v.
 Potass. iodid. gr. x.
 Aquæ destillat. f. $\frac{3}{4}$ xx. M.

Dose. — f. $\frac{3}{4}$ ij. to f. $\frac{3}{4}$ vj. *London Pharmacopœia.*

Liquor iodini compositus.

Compound solution of iodine.

(Lugol's Solution.)

R. Iodin. $\frac{3}{4}$ vj.
 Potass. iodid. $\frac{3}{4}$ iss.
 Aquæ destillat. Oj.

Dissolve the iodine and iodide of potassium in the water

Dose. — Ten to twenty drops, three times a day.
Pharm. United States.

*Tinctura iodini composita.**Compound tincture of iodine.*

R. Iodin. ℥j.
 Potass. iodid. ℥ij.
 Alcohol. Oij. M.

Dose. — Ten minims.

*Lond. and United States Pharmacopœia.**Mistura potassii iodidi compositus.**Compound mixture of iodide of potassium.*

R. Iodin. gr. ss.
 Potass. iodid. ℥ss.
 Syrup. papav. f.℥ss.
 Aq. destillat. Oss.

Dose. — Two table-spoonfuls, three times a day ; in cases of
complication of syphilis with scrophula. *Tyrrel.*

R. Iodin. gr. iss.
 Potassii iodid. gr. iij.

Solve in

Aquæ menth. pip. f.℥iv.

Dose. — A spoonful two or three times a day. To children, a
 tea-spoonful. In cases of *cancrum oris* ; also, in *dropsy*, *gleet*,
 and *leucorrhœa*. On renewing the prescription, the dose of the
 iodine may be increased one-half, and of the iodide one grain,
 each time. *Coster and Friedrich.*

R. Potass. iodid. ℥iv.
 Aquæ lactucæ, f.℥viij.
 — menth. pip. f.℥ij.
 Syrup. althææ, f.℥j.

Dose. — A spoonful, morning and evening, in a little water, in-
 creasing the dose to two spoonfuls. In cases of *hypertrophy of*
the ventricles of the heart. *Magendie.*

R. Potass. iodid. ℥iv.
 Aq. lactuc. f.℥viij.
 — flor. naph. f.℥ij.
 Tinct. digit. f.℥j. ad f.℥ij.
 Syr. althææ, f.℥iss. M.

Dose. — Morning and evening, a spoonful, in a little water.
In hypertrophy of the ventricles of the heart, with quickening of the heart's action. *Magendie.*

R. Quassia,
 Gentian. āā. ℥j.
 Aquæ bullient. f.℥xvj.
 Macera per horam et cola.
 Liquor colat. add.
 Potass. iodid. gr. xxxvj.
 — carbonat. ℥ij. M.

Dose. — A table-spoonful, three times a day, in a glass of water. *Cumming.*

Pilulæ potassii iodidi.

Pills of iodide of potassium.

R. Potass. iodid. gr. xv.
 Aq. destillat. q. s.
 Spong. ust.
 Ext. dulcamar. āā. ℥ij.
 Glycyrr. rad. pulv. q. s.

Fiant pilulæ clxxx.

Dose. — Six, two or three times a day, in *scrophula, goître,* &c. *Vogt.*

Unguentum iodini compositum.

Compound ointment of iodine. — Ioduretted ointment.

R. Iodin. ℥ss.
 Potass. iodid. ℥j.
 Alcohol. f.℥j.
 Adipis. ℥ij.

Rub the iodine and iodide with the alcohol, and mix with the lard.

Pharm. Lond. and United States.

Unguentum potassii iodidi.

Ointment of iodide of potassium.

R. Potass. iodid. ℥ss.
 Adipis, ℥iss. M.

Half a dram at first, and subsequently, a whole dram to be rubbed in. In *goître, scrophulous glandular affections, &c.*

This ointment is generally too weak, unless combined with the internal use of iodine in some form. *Magendie.*

R. Potass. iodid. ℥j.
 Adipis, ℥ss. M.

The wounded parts to be smeared with it two or three times a day: in *moist tetter—serpigo*. Between the applications, to be dressed with dry lint. *Tünnermann.*

In *dry tetter*, the ointment applied is formed of ℥j. to ℥iss. of *iodide* to ℥j. of *lard*.

Unguentum potassii iodidi.

*Ointment of hydriodic kali.—Ointment of iodide of potassium.**(Unguentum kali hydroiodici. Pharmacop. Borussic.)*

R. Potass. iodid. ℥j.
 Magnes. carb. gr. vj.
 Aq. destillat. guttas nonnullas,
 M. terendo cum,
 Ung. rosat. ℥j. M.

Or,

R. Potass. iodid.
 Sodæ carbon. depur. sicc. āā. ℥ss.
 Ung. rosat. ℥iv. ad ℥vj. M.

A piece, of the size of a small bean, to be rubbed in, morning and evening. In *chronic enlargement of the testis*.

Walther.

Messrs. T. and H. Smith,* of Edinburgh, having found it impracticable to make a neat ointment of iodide of potassium by

* Lond. and Edinb. Monthly Journ. of Med. Science, Oct. 1841.

the ordinary method, have recommended the following: Dissolve the requisite quantity of *iodide* in its own weight of *distilled* or *some perfumed water*, and then mix thoroughly in a mortar with the proper quantity of lard. The two will incorporate perfectly with a very little heating, and form a smooth ointment.

R. Potass. ioidid. ℥ss.
Ext. opii. ℥ss.
Cerat. ℥j. M.

As a dressing to *malignant cancerous ulcers*.

Unguentum potassii iodidi compositum.

Compound ointment of iodide of potassium.

R. Iodin. gr. xij.
Potass. ioidid. ℥iv.
Adipis, ℥ij. M.

In *scrophulous ophthalmia, ulcers, &c.*

Lugol.

R. Iodin. gr. xv.
Potass. ioidid. ℥j.
Tinct. opii, f.℥ij.
Adipis, ℥ij. M.

In *painful scrophulous ulcers, white swellings, &c.*

Lugol.

R. Potassii ioidid. gr. xij. — xv.
Ung. hydrarg. ciner. ℥ss. M.

In *herpes exedens*.

Blasius.

Emplastrum potassii iodidi compositum.

Compound plaster of iodide of potassium.

R. Iodin.
Potass. ioidid. āā. ℥ss. ad ℥j.
Emplastr. hydrarg. seu
———— saponis. ℥ij.

Applied in *syphilitic and gouty swellings of the bones*.

Ebers.

Linimentum potassi iodidi.

*Liniment of iodide of potassium.**(Baume hydriodaté.)*

- R. Potassii iodid. ℥j.
 Alcohol. (20°) f.℥iv. M.
- R. Sapon. ex oleo animal. confect. ℥iss.
 Alcohol. (20°) f.℥iv. M.

Mix these two solutions together; aromatise with a small quantity of oil of lavender, and before the mixture congeals, pour it into wide-mouthed vials.* This liniment has been much used at Lausanne under the name *Gelée pour le goître*.

Lotio potassii iodidi composita.

Compound lotion of iodide of potassium.

- R. Iodin. gr. i. ad ij.
 Potassii iodid. gr. ij. ad iv.
- Solve in
 Aquæ destillat. f.℥viij.

This solution was commonly used by Lugol externally, to be injected under the eyelids in *strumous ophthalmia, fistulæ, &c.*
Lugol.

- R. Iodin. ℥ss.
 Potassii iodidi, ℥j.
- Solve in
 Aq. destillat. f.℥vj.

This "*rubefacient solution of iodine*," may be used two or three times a week, when the last prescription loses its effect, or when it is desirable to stimulate more actively. It is also added to baths — three or four ounces to any ordinary bath — as well as to poultices, being mixed with an ordinary cataplasm.

Lugol.

* F. Boudet, *Journal de Pharmacie*, Avril, 1842, p. 335; and A. Duhamel, in *Amer. Journal of Pharmacy*, July, 1842, p. 102.

R. Iodin. \mathfrak{z} j.
Potass. iodid. \mathfrak{z} ij.

Solve in

Aquæ destillat. f. \mathfrak{z} ij.

This "*caustic iodine solution*" may be used when the last loses its efficacy. It occasions a crust on the parts. Lugol employs it chiefly when the skin on the edges of the *ulcers* is greatly hypertrophied, red, and fungous, as well as in *phagedenic or spreading tetters*. It may be applied two or three times a week, or daily, should the case require it. *Lugol.*

Collyrium potassii iodidi compositum.

Compound collyrium of iodide of potassium.

R. Iodin. gr. ss. ad i.
Potassi iodid. \mathfrak{O} ss.

Solve in

Aq. rosæ, f. \mathfrak{z} iiij. M.

To be applied four times a day, in cases of *scrophulous ophthalmia*, with *ulceration of the conjunctiva and cornea*.

Magendie.

CXX. POTAS'SII HYDRAR'GYRO-IO'DIDUM.

SYNONYMS. Potassii Iodo-Hydrargyras, Kali Iodatum Hydrargyratum, Iodo-Hydrargyrate of Potassium, Iodhydrargyrate of Ioduret of Potassium, Hydrargyro-iodide of potassium, Hydrargyro-biniodide of Potassium, Dihydrargyro-biniodide of Potassium.

Dr. A. Channing,* who has highly extolled this preparation in various diseases, affirms, that this, with other new salts, was discovered by Bonsdorff, of the University of Finland, in 1826; and it is a fact well known to the chemist, that iodine, chlorine, &c., enter into combinations so as to form both acids and bases.

By experiment, Dr. Channing ascertained, that a solution of eight grains of *pure iodide of potassium* in ten or fifteen minims of water, would combine with a fraction less than eleven grains

* American Journal of the Medical Sciences, Feb. 1834, p. 388.

of *red iodide of mercury*, and maintain the combination in solution, when diluted with water or alcohol to any extent. If more than eleven grains of the red iodide be added, although a small excess may be dissolved in the concentrated solution, on diluting with water, it is promptly precipitated. It would appear, therefore, as Dr. Channing has remarked, that in preparing this salt for administration, the labour of crystallising it, in order to obtain a solution of a definite strength, is wholly unnecessary; inasmuch as a solution, combining a fraction more than eight grains of the iodide of potassium with eleven grains of the iodide of mercury, may be used as containing twenty grains of the hydrargyro-iodide of potassium.

If it be desirable to obtain the preparation in a crystallised form, it is important, that the definite proportions of the two iodides should be observed, and particularly, that there be no excess of iodide of mercury; for the saturated solution of eight grains of iodide of potassium will dissolve, and enter into combination with, more than thirteen grains of iodide of mercury, forming similar crystals soluble in alcohol, but in water precipitating more than two grains of iodide of mercury.

This double salt may, also, be formed by dissolving one equivalent of *bichloride* or of *pernitrate of mercury* in a solution of four equivalents of *iodide of potassium*, evaporating to dryness, and dissolving the double iodide from the chlorohydrate or nitrate of potassa by means of *alcohol*. When made from the pernitrate of mercury, it is liable, however, to contain nitre, which may be detected by its insolubility in strong alcohol.*

EFFECTS ON THE ECONOMY.

These are similar to those of the iodides of mercury, but, according to Dr. Channing, in a less degree. The hydrargyro-iodide is not, however much employed, experience seeming to have shown, that it possesses no essential, if, indeed, any advantages over those preparations.

It has been highly extolled by Dr. Charles C. Hildreth,* of Zanesville, Ohio, in several diseases, in which a combination of iodine and mercury might be expected to be beneficial. In *ordinary dyspepsia*, his faith in its remedial powers is so strong that he had prescribed but little else for the previous four or five years. He speaks highly of it, also, in *enlargement of the spleen*, *amenorrhœa*, *dysmenorrhœa*, *leucorrhœa*, *dropsy*, and *glandular enlargements of a scrophulous character*. In these

* Ambrose Smith, Amer. Journ. of Pharm. Jan. 1841, p. 271.

† American Journal of the Medical Sciences, Aug. 1840, p. 314.

last cases, he combines the internal use with the external, according to the form of ointment given below.

Puche* has recommended it as not being so subject to produce salivation, or pains in the bones, as the other combinations of mercury and iodine.

METHOD OF ADMINISTERING.

Mistura potassii hydrargyro-iodidi.

Mixture of hydrargyro-iodide of potassium.

R. Hydrarg. ioidid. rubr. gr. iv.
Potassii ioidid. ℥j.
Aquæ destillat. f.℥j. M.

Dose. — Five drops, three times a day .

Channing.

R. Hydrargyri ioidid. rubr.
Potassii ioidid. āā. gr. iv.
Aquæ, f.℥i. Solve.

The dose of this is from two to six drops, equivalent to from about the thirteenth to the twelfth of a grain of the double salt.†

Tinctura potassii hydrargyro-iodidi.

Tincture of hydrargyro-iodide of potassium.

R. Potass. hydrargyro-iodid. gr. j.
Alcohol. dilut. f.℥j. M.

Dose. — Ten drops, three times a day.

Channing.

Pilulæ potassii hydrargyro-iodidi.

Pills of hydrargyro-iodide of potassium.

R. Hydrarg. ioidid. rubr. gr. viij.
Potassii ioidid. gr. viij.
Sacchar. lact. gr. lxiv.
Mucil. acac. q. s. ut fiant pilulæ xxxij.

Dose. — One to eight, daily.

Puche.

* Journal des Connaissances Médicales, Oct. et Nov. 1838, and Janvier, 1839; and Annales de Chimie, Oct. 1838.

† Ambrose Smith, Amer. Journ. of Pharmacy, Jan. 1841, p. 270.

Liquor potassii hydrargyro-iodidi.

Solution of hydrargyro-iodide of potassium.

R. Hydrarg. iodid. rubr. gr. viij.
 Potassii iodid. gr. viij.
 Aquæ destillat. f.℥viij. M.

Dose. — f.℥ij. to f.℥ij. in twenty-four hours. *Puche.*

Unguentum potassii hydrargyro-iodidi.

Ointment of hydrargyro-iodide of potassium.

R. Hydrarg. iodid. rubr. gr. vij.
 Potass. iodid. ℥ij.
 Adipis ——— ℥j. M.

To be applied to *tumours*, two or three times a day. Should it prove too irritating, the proportion of lard must be increased.
Hildreth.

QUINIA ET EJUS SALES.

SYNONYME. Quinia and its salts.

CXXI. QUINIA.

SYNONYMES Quinina, Quina, Quininum, Quinium, Chininum, Chininium, Chinum, Kininum, Sal Essentiale Corticis Peruviani.

French. Quinine, Kinine.

German. Chinin, Quinin, Chinastoff.

Quinia is a most important gift from modern analytical chemistry to medicine. Not many years have elapsed since the discovery of this substance, and yet, by general consent, it is now regarded as one of the most valuable remedies in the catalogues of the materia medica. The honour of the discovery — which had been facilitated by the investigations of other chemists, as to the composition of the cinchona barks — belongs to Pelletier and Caventou, (1820,*) and so rapidly and extensively was its efficacy

* Annales de Chimie et de Physique, xv. 289 and 337.

promulgated, that in the year 1826, in two laboratories in Paris for the preparation of quinia, fifty-nine thousand ounces of the sulphate — the form best known, and most frequently prescribed — were prepared. For this discovery, the Royal Academy of Sciences of Paris awarded MM. Pelletier and Caventou the Monthyon prize of ten thousand francs.

It would appear from the observations of Henry and Plisson, that cinchonia and quinia exist in cinchona bark in combination with kinic acid and also with red cinchonic, which is an insoluble red colouring matter.*

Quinia is obtained from yellow bark by a similar process to the one described for the separation of cinchonia.† In the pure state, it is of a white colour, and appears commonly in the form of powder; it crystallises, however, in silky, shining, tufted needles. In both cases, it contains from three to four *per cent.* of water. By a gentle heat, this escapes, and the quinia melts into a transparent fluid, which, on cooling, is translucent, and similar to a resin. When melted *in vacuo*, it has a crystalline appearance. In a strong heat, it is decomposed. It has a very bitter taste, and is soluble in 200 parts of boiling water; a portion being precipitated on cooling. It requires a much larger proportion of cold water to dissolve it. In alcohol, it is far more soluble than in water. It is, likewise, soluble in ether, and somewhat so in oils. It exhibits an alkaline reaction, — restoring the colour of reddened litmus paper, and neutralising the acids.

The observations of Piorry and Lavollée‡ and of Quévenne,§ show, that quinia, as well as its sulphate, passes into the urine of patients who use it in any considerable quantity.

EFFECTS ON THE ECONOMY.

Of the effects of quinia we shall speak at some length, under the head of SULPHATE OF QUINIA with which it seems to accord entirely in medicinal agency. Several physicians, who have experimented in regard to the efficacy of pure quinia and its salts, have found the first in no respect inferior to the last. Such was the experience of Niewenhuis and Elliotson, the latter of whom exhibited quinia in large doses — as much as five grains every four hours. A French physician, Blegnie,|| even gives the pre-

* Journ. de Pharmacie, xiii. 269 and 369, and Pereira, Elem. Mat. Med. and Therap. ii. 1397, Lond. 1842; or Amer. edit. by Dr. Carson, Philad. 1843.

† See page 167.

‡ Gazette Médicale, 1836, p. 73.

§ L'Experience, Juillet, 1838.

|| Riecke, Die neuern Arzneimittel, S. 118. See, also, Bally, in Magendie's Journal de Physiologie, ii. 236.

ference to pure quinia — because it possesses, he thinks, equal efficacy, is cheaper, easier taken, and better borne than the sulphate. He advises, that after each dose an acidulous drink should be taken, to render its solution in the stomach more rapid. Wutzer* and Harlest† have also recommended the more frequent use of pure quinia.

It may be given either in the form of powder or pill, or in alcoholic solution.

Tinctura quiniæ.

Tincture of quinia.

R. Quiniæ, ℥j.

Solve in

Alcohol. f. 3 ss.

Dose. — Twenty to forty drops every two hours.

Wutzer.

CXXII. QUININÆ ACETAS.

SYNONYMES. Quininæ acetat, Chinium Aceticum, Chininum Aceticum, Acetas Chinii, Acetas Chinini, Acetas Chinicus seu Quinicus, A. Quiniæ, A. Quinæ, A. Quinini, A. Quinii, A. Kinini, Quina Acetica, Acetate of Quinia or Quinine.

French. Acetate de Quinine.

German. Essigsäures Chinin.

This preparation is not much employed. It is prepared by saturating quinia with *concentrated acetic acid diluted with water*, and evaporating the neutral solution, by gentle heat, to crystallisation.

It appears in the form of very delicate, needle-shaped, snow-white, satiny, and shining crystals; tastes very bitter; and is with difficulty soluble in cold water, but readily so in hot.

Wutzer and Sundelin‡ assert, that it acts like the other salts of quinia, but merits no preference.

* Isis, p. 441, 1829.

† Heidelberg klinisch. Annalen, B. v. H. 4, S. 573.

‡ Isis, p. 441, 1829; also, Heidelb. klinisch. Annal. B. v. H. 4, 575.

CXXIII. QUININÆ CITRAS.

SYNONYMES. Quininæ Citras, Quinini Citras, Quiniæ vel Quinæ vel Quinii vel Chinini vel Kinini Citras, Citras Chinii seu Chinicus seu Quinicus, Chinium Citricum, Chininum Citricum, Quina Citrica, Citrate of Quinia or Quinine.

French. Citrate de Quinine.

German. Zitronsaures Chinin, Citronsaures Chinin.

MODE OF PREPARING.

This preparation is formed, like the acetate, from an aqueous solution of *citric acid*, and pure *quinia*; or by the decomposition of a hot solution of *sulphate of quinia*, by means of an *acid citrate of soda*.*

It forms needle-shaped prisms, of a white colour, which are by no means readily soluble in water.

EFFECTS ON THE ECONOMY.

The acetate and the citrate of quinia have been highly esteemed; and are adapted for those excitable persons with whom the sulphate does not seem to agree. The citrate has been prescribed by many Italian physicians, and found to be very efficacious.† Magendie considers it, when it contains an excess of acid, advisable for those cases, where the union of a tonic with an antiseptic property is indicated. He considers, that the following syrup may be substituted, in certain cases, for the *syrupus antiscorbuticus*, which is directed by the *Codex Medicamentarius* of Paris to be prepared in the following manner:—Take of the fresh leaves of *cochlearia*, *water trefoil*, *cress*, *horseradish*, and *bitter oranges*, cut, of each one pound; *cinnamon*, an ounce and a half, *white wine*, four pints. Macerate for two days in a tin cucurbit, covered with a well luted capital. Distil, in a sand-bath, a pint of fluid; to which add two pounds of white sugar, and make into a syrup. Pass through a cloth, without straining, what remains in the cucurbit; let the liquor rest; decant and boil to the consistence of syrup, with two pounds of white sugar. When cold, clarify and mix with the other.

* Guleani, in *Annali Universali di Medicina*, Luglio, 1832, and *Heidelb. Klinish. Annal.* B. x. H. i. S. 34. *Heidelb.* 1834.

† Beraudi, in *Bulletin Général de Thérapeutique*, Nov. 1838.

Syrupus quiniæ citratis.

Syrup of citrate of quinia.

R. Syrup. Oi.

Quiniæ acetat. acid. gr. xxxvj. M.

Dose. — Two spoonfuls, in the twenty-four hours.

CXXIV. QUININÆ FERROCYANURETUM.

SYNONYMES. Quiniæ Ferrocyanas, Chinium Ferrocyanogenatum, Ch. Ferrohydrocyanicum, Ferrocyanas Chinii, &c., Ferrocyanate or Hydrocyanoferate of Quinia or Quinine.

French. Ferrocyanure de Quinine.

German. Eisenblaures Chinin.

METHOD OF PREPARING.

This is obtained by the decomposition of *sulphate of quinia* by means of a solution of the *ferrocyanuret of potassium*; after which the impure salt is treated with *warm alcohol*, and the clear solution is evaporated.*

It forms needle-shaped, confused crystals, of a greenish-yellow colour, and very bitter taste, recalling that of hydrocyanic acid. It dissolves readily in spirit of wine, not so in water; and is decomposed by hot water.

EFFECTS ON THE ECONOMY.

In this combination, the antifebrile properties of the quinia are said to be even superior to those of the other preparations; yet the remedy has not got into much use. It has been employed mainly by a few of the French practitioners. Cerioli† and Zacharelli, Italian physicians, speak in high terms of its efficacy in *periodical diseases*, even where the sulphate has failed. Cerioli

* See Bertozzi's Method, in Journal de Pharmacie, xix. 45, and Philad. Journ. of Pharmacy, vol. 2, new series, p. 82. Philad. 1837. See, also, Mr. Donovan, in Dublin Journ. of Med. Sciences, July, 1840, p. 440.

† Annali Universali di Medicina, Luglio, 1832, and Archives Générales de Médecine, Dec. 1832.

gave it in the dose of from two to eight grains, in the day ; and Gouzee* gives the history of three cases completely cured by the administration of a single grain, half an hour before the paroxysm.

MODE OF ADMINISTERING.

The following formulæ have been recommended :

Haustus quiniæ ferrocyanureti.

Draught of ferrocyanuret of quinia.

R. Quiniæ ferrocyanur. gr. iv.

Alcohol. f.ʒj.

Solve et adde

Aquæ camphor. f.ʒvij. M.

et fiat haustus.

To be taken as occasion may require, first shaking the vial.

Donovan.†

Pilulæ quiniæ ferrocyanureti.

Pills of ferrocyanuret of quinia.

R. Quiniæ ferrocyanur. gr. xxiv.

Mucilag. acaciæ, q. s.

fiat massa in pilulas xij. dividenda.

Two for a dose.

Donovan.

CXXV. QUININÆ MURIAS.

SYNONYMES. Quiniæ Murias, Chinium Muriaticum, Ch. Salitum seu Hydrochloricum, Hydrochloras seu Murias Chinii, H. Chinicus seu Quinicus, Chlorhydras Quinicus, Muriate of Quinia or Quinine.

French. Muriate de Quinine.

German. Salzsaures Chinin, Hydrochlorsaures Chinin.

Perhaps, next to sulphate of quinia, this salt has most frequently been employed in practice.

* Observateur Médical Belge, Jan. 1834.

† Op. citat.

METHOD OF PREPARING.

It is obtained by dissolving pure *quinia* in *dilute muriatic acid*, or by the decomposition of *sulphate of quinia* dissolved in *warm water*, by means of a solution of *chloride of barium*, which is added so long as a white precipitate is thrown down; the hot mixture is then filtered; the precipitate is washed, and the clear fluid evaporated, by a gentle heat, to crystallisation, so long as crystals shoot on cooling; these are collected, washed in cold water, and purified by repeated crystallisation.

It forms fine, needle-shaped, white silky crystals, of a mother-of-pearl lustre; does not dissolve readily in water, but more so than the sulphate.

EFFECTS ON THE ECONOMY.

In this respect, the muriate agrees with the sulphate of quinia, and by those of weak digestive powers is borne better. Spielman* asserts, that it is a more speedy and effectual remedy for *intermittent fever* than the sulphate, and it is more soluble. It is, however, more expensive. The dose is generally considered to be the same as that of the sulphate. It is better given in solution than in powder. Spielman rates the dose at from half a grain to a grain.

CXXVI. QUININÆ NITRAS.

SYNONYMES. Quininæ Nitras, Chinium seu Chininum Nitricum, Nitras Chinii, &c. Nitrate of Quinia or Quinine.

French. Nitrate de Quinine.

German. Saltpetresaures Chinin.

METHOD OF PREPARING.

This salt is obtained like the muriate, by the addition of *nitric acid* to *quinia*; or by the decomposition of *nitrate of baryta* by *sulphate of quinia*.

It is, at first, a fluid oil-like mass, which gradually becomes

* Allgemein. medicinisch. Zeitung, and Journal des Connais. Médic. Février, 1836; see, also, Prof. Dierbach, in Heidelb. klinish. Annal. B. x. H. i. S. 33. Heidelb. 1834.

solid. In union with water it forms crystals. It dissolves with difficulty in water, but readily in alcohol.

CXXVII. QUININÆ PHOSPHAS.

SYNONYMES. Quininæ Phosphas, Chinium seu Chininum Phosphoricum, Phosphas Chinii, Ph. Chinini, Phosphate of Quinia or Quinine.

French. Phosphate de Quinine.

German. Phosphorsaures Chinin.

METHOD OF PREPARING.

In mode of preparation, it accords with the preceding forms; *dilute phosphoric acid* being added to *quinia*, or *phosphate of baryta* to *sulphate of quinia*.*

It appears in the form of needle-shaped prisms, of a mother-of-pearl lustre, which are, like the muriate of quinia, readily soluble in water, and spirit of wine. Harles,† however, affirms, that in the neutral condition it dissolves, with difficulty, in water.

The phosphate is regarded by some to stand next to the sulphate in medicinal efficacy.

CXXVIII. QUININÆ SULPHAS.

SYNONYMES. Quininæ Sulphas, Quinæ Disulphas, Q. Sulphas, Chinium seu Chininum Sulphuricum, Sulphas Chinii, Sulphas Quinicus, Sulphate of Quinia or Quinine.

French. Sulfate de Quinine.

German. Schwefelsaures Chinin, Chininsulphat.

This preparation of quinia is by far the most frequently administered. It is in fine, silky, flexible needles, and at times in rectangular columns. Its taste is extremely bitter, and resembles that of yellow bark. Exposed to a moderate heat, it loses its crystalline form, in consequence of the escape of its water

* Winkler, in Büchner's Repert. and Phila. Journ. of Pharmacy, new series, vol. 2, p. 12. Phila. 1837.

† Heidelb. klinisch. Annal. B. x. H. i. S. 36. Heidelb. 1834; and Journal de Chimie Médicale, 1837.

of crystallization. It is only slightly soluble in cold water, requiring 740 parts at the ordinary temperature, and 30 parts of boiling water for its solution. In alcohol, it is very soluble, but only slightly so in ether. With sulphuric acid, it forms a supersulphate, which is much more soluble in water than the neutral salt, and hence we usually add a few drops of dilute sulphuric acid to our mixtures of sulphate of quinia.

METHOD OF PREPARING.

This salt is generally prepared on a large scale in the chemical laboratories of France; whence we obtain it. A formula was admitted, however, into the Pharmacopœia of the United States (1830), which was taken from the process of M. Henry, Junr.,* for which he received a prize from the *Académie Royale des Sciences*, of Paris. It is as follows:—Take of *Yellow bark*, in powder, a pound; *Lime*, in powder, four ounces; *Sulphuric acid*, *Alcohol*, *Animal charcoal*, *Distilled water*, each a sufficient quantity. Boil the bark for half an hour with eight pints of the distilled water, acidulated with a fluid ounce of the sulphuric acid. Strain the decoction through linen: then boil the residue with the same quantity of acidulated water, and filter as before. Mix the filtered liquors, and, gradually add the lime, stirring constantly. Wash the precipitate with distilled water, and having dried it digest in alcohol with a moderate heat. Pour off the tincture, and repeat the digestion several times, till the alcohol is no longer rendered bitter. Mix the tincture, and distil over the alcohol, till a brown viscid liquid remains in the retort. Upon this substance, removed from the retort, pour as much sulphuric acid, largely diluted with water, as may be sufficient for its perfect saturation. Then add the animal charcoal, and having evaporated the liquor sufficiently, filter while hot, and set it aside to crystallise.

In the last edition (1842), the form has been modified as follows:—Take of *Yellow bark*, in coarse powder, ℥iv.; *Muriatic acid*, f.ʒiij.; *Lime*, in powder, ʒv.; *Water*, five gallons; *Sulphuric acid*, *Alcohol*, *Animal charcoal*, each a sufficient quantity. Boil the bark in one-third of the water mixed with one-third of the muriatic acid, and strain through linen. Boil the residue twice successively with the same quantity of water and acid as before, and strain. Mix the decoction, and, while the liquor is hot, gradually add the lime, previously mixed with two pints of water, stirring constantly, until the quinia is completely precipitated. Wash the precipitate with distilled water, and,

* Journal de Pharmacie, vii. 296. Juillet, 1821.

having pressed and dried it, digest it in boiling alcohol. Pour off the liquor, and repeat the digestion several times, until the alcohol is no longer rendered bitter. Mix the liquors, and distil off the alcohol, until a brown viscid mass remains. Upon this substance, removed from the vessel, pour about half a gallon of distilled water, and, having heated the mixture to the boiling point, add as much sulphuric acid as may be necessary to dissolve the impure alkali. Then add an ounce and a half of animal charcoal, boil for two minutes, filter the liquor while hot, and set it aside to crystallize. Should the liquor, before filtration, be entirely neutral, acidulate it very slightly with sulphuric acid; should it, on the contrary, change the colour of litmus paper to a bright red, add more animal charcoal. Separate the crystals from the liquor, dissolve them in boiling water slightly acidulated with sulphuric acid; add a little animal charcoal, filter and set aside to crystallize; wrap the crystals in a bibulous paper, and dry them with a gentle heat. The mother water may be made to yield an additional quantity of sulphate of quinia by precipitating the quinia with solution of ammonia, and treating the precipitated alkali with water, sulphuric acid, and animal charcoal as before.*

It results from the calculations of Pelletier and Caventou, that from a quintal of cinchona, two pounds, one dram and thirty grains of sulphate of quinia may be obtained, which makes two drams, sixty-six grains and a sixth per pound, or thirteen grains and two-sixths per ounce; and as the sulphate is composed of nine parts and nine-tenths of sulphuric acid to ninety and a tenth of quinia, it follows that if the dose of cinchona in substance be two drams, we should administer to the patient three grains and nine thirty secondths of a grain of sulphate of quinia; not taking into account a small quantity of sulphate of cinchonia, which may be mixed with it. Four grains of the salt are, consequently, more than an equivalent for the dose of the cinchona often prescribed in substance. Those practitioners, therefore, who prescribe thirty-six or seventy-two grains of the sulphate, give the representative of about twenty-seven drams of cinchona in the former case, and of fifty-four in the latter.†

Sulphate of quinia is liable to be adulterated, — for example, by mannite, which is similar in external appearance, but — as elsewhere shown — destitute of all its properties. The adulteration can be readily detected by means of pure alcohol, which dissolves the quinia alone, but leaves the mannite untouched, which is freely soluble in water, and is known by its characteristic sweet taste. It is also adulterated with gypsum, the pre-

* Pharm. of the United States, p. 174, Phila. 1842.

† Jourdan, Pharmacopée Universelle, ii. 375. Paris, 1828.

sence of which may likewise be detected by the alcohol, which does not dissolve it.*

The quantity of sulphate of quinia prepared is very great. In this country, it was formerly obtained altogether from France, but the Author has been informed, that from 6000 to 8000 ounces are annually made by one firm in the city of Philadelphia.†

EFFECTS ON THE ECONOMY.

The effects of the preparations of quinia on the healthy organism have not been much investigated. According to Caventou, they produce a general excitement, similar to that caused by coffee, and Wittmann affirms, that the sulphate induces an excitement similar to that of a paroxysm of fever. Hirschel,‡ too, asserts, that in a child, four years of age, to whom the sulphate was given in a case of *intermittent*, a general chilliness of some minutes' duration supervened immediately on taking the remedy, succeeded, in the course of half an hour, by general heat, and this again by a gentle perspiration, in all respects resembling a mild attack of fever.

The excitant action of the salts of quinia formed by the vegetable acids is said to be less striking.

Sulphate of quinia, in large doses, appears, in some cases, to possess narcotic properties, yet it can scarcely be classed amongst poisons, as it has been given to healthy individuals in very large doses, without any unpleasant effects. Bally,§ for instance, gave it to the extent of 110 grains in the day without any inconvenience. Dr. Thomas Fearn,|| who administered it largely, regards it to be more narcotic than sedative,—usually, he thinks, stimulating in small doses, but in large doses the stimulant effects not being obvious, but rather the reverse; and such appears to be the view of Dr. A. Flint.¶

When Mr. Scott,** a medical gentleman and a martyr to *dyspepsia*, took quinia in very large doses, under the idea that his malady was intermittent neuralgia, he found several singular phenomena induced thereby. He was directed to commence with two grains three times a day, until he arrived at twenty

* Vallet and Dubail, *Journal de Pharmacie*, Janvier, 1840.

† See his *General Therapeutics and Materia Medica*, vol. 2, p. 80, Philad. 1843.

‡ Hufeland's *Journal*. B. lxi. St. 6. S. 140.

§ *Revue Médicale*, v. 244. Juillet, 1821.

|| *Transylvania Journal of Medicine*, Oct., Nov., and Dec. 1836, p. 798, and *Dunglison's Amer. Med. Intell.* June 15, 1837, p. 109.

¶ *Amer. Journ. of Medical Sciences*, Oct. 1841, p. 277.

** *Lond. Med. and Physical Journal*, March, 1833.

grains for a dose, that is, a dram a day. Until the doses were increased to fourteen or sixteen grains, he did not experience any peculiar effects, but he now began to feel heat of skin, dryness of mouth and fauces, and obstinate constipation. He likewise lost the power of naming substantives; was obliged for a long while to consider what familiar things were called, and was unable to cast up a line of six or eight figures correctly. His perceptions of quantity were likewise impaired, so that in prescriptions he wrote ounces for drams, drams for grains, &c., &c. He still, however, persevered with the quinia, until he took $\mathfrak{z}\text{j}$. four times a day, but he was unable to continue these excessive doses long, the untoward symptoms augmenting, so that he was often unable to stand, and fell several times in the street.

Very similar results to those observed by Mr. Scott, and especially as regards the inability of utterance — which, in their cases, was complete — are recorded by M. Ménage,* and Mr. G. O. Heming.†

Cases of deafness caused by large doses have been lately detailed by Dr. Joseph Williams, of London,‡ by Mr. C. R. Bree,§ of Stow-market, England; by M. Fr. Lugeol, of Havana,|| and by Prof. Giacomoni.¶

MM. Trousseau and Pidoux** refer to the case of a soldier who took 48 grains of the sulphate for the cure of spasmodic asthma, which returned daily at a certain hour. Four hours after taking it, he experienced buzzing in the ears, diminished sensibility, giddiness, and violent vomiting. Seven hours after taking it, he was blind and deaf, delirious, incapable of walking by reason of the giddiness, and vomited bile copiously. He was, in fact, in a state of intoxication. The symptoms gradually subsided.

In impressible individuals, the sulphate and the muriate — even in moderate doses — not unfrequently induce a sense of anxiety, restlessness, vertigo, confusion, depravation of vision, tinnitus aurium, and, in many cases, transient deafness, all which symptoms appear to be of a neuropathic character, and, it has been affirmed, occur more frequently in females, especially in those who are pregnant or suckling — and in persons of slender and delicate conformation.†† In certain cases, quinia and its

* Gazette Médicale de Paris, April 25, 1840.

† London Lancet, and Philad. Med. Examiner, July 18, 1840, p. 468.

‡ London Lancet, July 25, 1840, p. 639.

§ Ibid. Aug. 22, 1840, p. 786.

|| Bullet. Gén. de Thérap. Mars, 1842.

¶ Annali di Medicin. Feb. 1841, and Journal de Pharmacie, Sept. 1842, p. 209.

** Traité de Thérapeutique, ii. 217.

†† Riecke, Die neuern Arzneimittel, S. 120.

salts seem to have caused ptyalism — the saliva being inodorous, and the teeth firm ; and, when calomel has been given along with it, it has been conceived that ptyalism has ensued sooner than it otherwise might have done.

Recently, a question has been raised as to the ultimate innocuousness of large doses of the sulphate ; and cases have been referred to in which fatal or serious results supervened in acute and chronic rheumatism, and in amaurosis from 70 or 80 grain doses in the practice of some of the physicians of Paris.*

The most striking agency of quinia and its salts, is in cases of *periodical diseases of all kinds* ; and especially in *intermittent fever* ; they have now, indeed almost wholly taken the place of the cinchona, over which they possess many points of preference. In the first place, their bulk is much less ; they therefore do not oppress the stomach so much, whilst the impression of the cinchona on that organ not unfrequently interferes with its antipyretic properties. In *malignant fevers*, too, it is often impossible to introduce the requisite quantity of cinchona, into the organism, to prevent the succeeding paroxysm, and the life of the patient is consequently placed in the greatest danger. In this case, sulphate of quinia is invaluable ; possessing as it does, the febrifuge virtues of cinchona in such a concentrated state, that but a small quantity is required to produce equal efficacy with a large quantity of powdered cinchona. In such cases, indeed, the latter is apt to disagree with, or be rejected by the stomach, before its full influence can be exerted. In these *pernicious fevers*, that occur especially in Italy and Holland, sulphate of quinia has supported life in innumerable cases where cinchona, in substance, might have failed, and has thereby best exhibited its sanative agency.† In these cases, quinia is administered without regard to complications, which, in less urgent cases, might be allowed to interfere with its administration. Another advantage, ascribed to quinia, is, that in cases of paroxysmal fevers, in which the attacks follow each other so closely, that the second commences before the first has terminated, it may be given during the paroxysm, a time at which cinchona would be apt to occasion oppression of the stomach and vomiting. It has likewise been found advantageous in large doses — twelve to thirty grains and more daily — in *engorgement of the spleen*, consequent on intermittent fever ;‡ and M. Levy§ has seen the

* Philad. Med. Examiner, Feb. 4, 1843, p. 24.

† Repertorio Medico-Chirurgico. per l'anno 1822, Torino. No. 22. Med. Chirurg. Zeitung. B. ii. S. 137, 1823 ; and Richter's Specielle Therapie, B. x. S. 326, Berlin, 1828.

‡ For the opinions of MM. Bally, Nonat, and Piorry, on this subject, see Medico-Chirurg. Rev. July, 1840, from La Lanquette Française.

§ Op. cit.

dropsical effusions, that not unfrequently supervene on neglected cases of the same disease, yield readily to the sulphate in full doses.*

Recently its use has been recommended in asthma by Dr. B. R. Hogan.† He gave it in doses of from two to eight grains, repeated in an hour, if relief should not follow. He also affirms, that in the forming stage of *croup*, in the case of a child, two years old, two grains of sulphate of quinia, and a snuff plaster on the chest warded off the attack. In the *typhoid fever of children* it was found serviceable by MM. Rilliet and Barthez.‡ Trials of the remedy have likewise been made at the Hôpital Cochin in Paris by M. Blache, in the *typhoid fever of adults*, the results of which were favourable. The cases, however, were not numerous, and in certain of them other remedies were prescribed either before or in conjunction with the sulphate of quinia. Afterwards, some of the patients of M. Husson, at the same hospital, were subjected to the same mode of treatment, and the results have been published by M. Laurent.§ The dose of the medicine usually prescribed was three-quarters of a grain every hour; at times, the dose was larger, and given less frequently; and, in several instances, two drams and more were given in the twenty-four hours for several days together. In thirteen cases no other remedy was administered, but although the patients recovered, the results did not show any great superiority over other modes of management. In no instance were the phenomena arrested by the quinia. Of ten patients, who had the disease mildly, all recovered but one, whose death was attributed by M. Laurent to the quinia. Of three patients labouring under the disease in a severe form, one only recovered; and he was for a time in great danger from intestinal hemorrhage. The report of M. Laurent is not very favourable to the beneficial effects of quinia in typhoid fever.

Besides their febrifuge property, the salts of quinia possess a tonic virtue, that adapts them for numerous cases in which that class of remedies is indicated. Yet there are many who think that cinchona is better calculated for such cases than quinia, and who administer the latter to prevent the paroxysms of an intermittent, but have recourse to cinchona, when they are desirous of fortifying the system to prevent a relapse. There are cases, too, which resist quinia, and its preparations, and which subse-

* Bulletin Général de Thérapeutique, Nov. 30, 1837, and M. Levy, Gazette Méd. No. xxii. and Encyclographie des Sciences Médicales, Juillet, 1840, p. 287.

† Dunglison's Amer. Med. Intelligencer, Feb. 1842, p. 153.

‡ Archiv. Général de Méd. Juin, 1841, or Encyclogr. des Sciences Méd. Juillet, 1841, p. 89.

§ Archiv. Général de Med. Sept. 1842, and Brit. and For. Med. Review, Jan. 1843, p. 235.

quently yield to cinchona in substance, but this may be owing to the quantity of lignin, or woody matter in the bark in substance, aiding the quinia of the cinchona in producing that new impression on the nerves of the stomach, which is necessary to break in upon the paroxysmal catenation.

In its antiseptic virtues, also, sulphate of quinia is inferior to cinchona. It has been doubted, indeed, whether it possess any such virtues at all.

Lastly : there is an advantage possessed by sulphate of quinia, — that in irritable or impressible persons, it may be exhibited endermically, and thus no disorder be induced in the digestive actions. It need scarcely be said, that cinchona is not adapted for this mode of administration.

MODE OF ADMINISTERING.

Sulphate of quinia may be administered internally in the form of powder or pill, and in solution in water, alcohol, or syrup. The average dose, in the twenty-four hours of apyrexia, is from four to ten grains; yet it has been given frequently to a much greater extent. As in the case of cinchona, it has also been advised, that a large dose should be given immediately before the expected paroxysm, so as to render the frequent administration during the apyrexia unnecessary : this dose need not be so great as the combined doses would amount to, so that there may be economy in the plan. Dupasquier, Elliotson,* the Author, and many others, have found this course eminently successful ; but some object to it.

In ordinary intermittents, the Author is in the habit of administering the sulphate in the form of the *mistura quiniæ sulphatis*, given hereafter. As the antispasmodic virtues of the remedy are exerted through the nervous system, he considers it advisable to impress not only the nerves of the stomach but those of gestation, which cannot be effected by the pilular form. Half the mixture — or five grains of the sulphate — is given about an hour before the paroxysm, and the remainder half an hour afterwards : and if signs of the paroxysm appear notwithstanding, he directs 50 or 60 drops of the tincture of opium to be given. This course rarely fails.†

A case of *severe remittent* has been detailed by Dr. Thomas Fearn,‡ in which he gave, at one dose, three tea-spoonfuls — weighing thirty-two grains. At the end of an hour, there was

* Medico-Chirurgical Transactions, xii. 543, Lond. 1824.

† See the Author's Practice of Medicine, ii. 496. Philad. 1842.

‡ Op. cit.

a diminution in the frequency of the pulse — “the invariable effect,” he says, “of large doses of quinia, when its operation is favourable.” The dose was repeated, and at the end of another hour, it was again given, making ninety-six grains in two hours. Dr. Fearn remarks, that his usual practice in remittent fever had been to give three doses of twenty grains each, with an interval of an hour between.

Of late, it has been the practice, with some physicians, to administer sulphate of quinia in very large dose — gr. xx. to gr. xl. — in ordinary intermittent fever;* and there may be cases in which after the disease has resisted ordinary doses it may yield to these; but the Author has not met with any such. It has been recently affirmed, indeed, that M. Piorry, who was formerly an advocate for large doses of the sulphate in intermittents, now affirms, that he obtains the same results from doses of 15 grains, as he did from those of 70 and 90.†

Generally, between the paroxysms, several doses are administered; and, according to the particular case, the efficacy of the salt of quinia is attempted to be increased by the addition of antimonials, laxatives, carminatives, &c., and — in pernicious or malignant intermittents especially — of opium or morphia.

Recently, much attention has been directed at New Orleans to the treatment of *yellow fever* by very large doses of sulphate of quinia — from a scruple to a dram — and it is said that great success has attended its administration in the practice of Drs. Hunt, Beattie, Farrel, Mackay, and others.‡

By many, a combination of quinia with moderate doses of cinchona is highly recommended. Chapman advises its union with piperin: a combination with the alcoholic extract of cinchona has also been prescribed.

Mr. Sherwin,§ of Hull, affirms, that a piece of apple, chewed for a moment, immediately annihilates the bitter taste left by it.

Sulphate of quinia may be used in the way of enema, and endermically, when the condition of the stomach forbids its internal employment. As an enema, three times the ordinary dose, or more, may be mixed with starch, and be thrown up a short time before the paroxysm, or at the inception of the same. In this way it has been found efficacious.||

In administering the sulphate, or muriate of quinia, endermically, a space on the surface of the body is deprived of its cuticle by means of a blister, and on this denuded portion the agent is applied either in the form of powder or of ointment. In testimony

* Dr. A. Flint, in American Journal of Medical Sciences, Oct. 1841, p. 278.

† Philad. Med. Examiner, Feb. 4, 1843, p. 24.

‡ Ibid. Oct. 19, and Oct. 26, 1839.

§ Lond. Med. Gazette, April 1, 1837.

|| Richter, Op. cit. S. 331. Berlin, Medicin. Zeitung. Jan. 4, 1837.

of the efficacy of this mode of administering the salts of quinia, many observers have come forward, — Lesieur, Lember, Martin, Wesche, Lehmann, Reilingh, Stratingh, Lieber, G. Lane Corbin,* and others. From four to eight grains may be placed on the denuded part once or oftener in the day. Dr. Lieber, of Berlin, seems to have prescribed the salt most frequently in this way: he mentions, that of sixty cases, in which he employed it, only eight or ten were unsuccessful; and there was reason to believe, that in these cases the internal administration of sulphate of quinia would have failed also. In the case of adults, he applies a blister in the evening — of the size of a dollar — over the epigastric region; in the morning, during the apyrexia, the blister is cut; the cuticle removed, and five or six grains — in children two grains — of the sulphate are sprinkled over the denuded surface. The whole is then covered with adhesive plaster, which must extend to the breadth of a finger over the edges of the blistered part.

The sprinkling of the sulphate always occasions a violent burning sensation, but if it be applied in the form of ointment, this evil is avoided, or at least diminished. The pain, however, speedily, disappears. Some hours after the application of the remedy, oppression is felt in the stomach, with a desire to vomit, without, however, vomiting supervening; borborygmi, or uneasiness in the bowels, and frequently fluid dejections, with augmented secretion of saliva, which, in some cases, continues for several days.

In the course of from twelve to twenty-four hours after the application, a very bitter taste is generally perceived over the whole tongue, similar to that of quinia; and if the application has been made sufficiently long before the anticipated paroxysm, it may be entirely prevented, or be rendered much milder. After the effect has been produced, the adhesive plaster may be kept applied for some days, and, if the sore is not healed, it may be dressed with simple applications. In only two cases did Dr. Lieber observe any extensive or offensive suppuration; and both healed under simple dressings with dry lint.

Rubbing quinia on the gums has, likewise, been occasionally recommended, as well as frictions with the alcoholic solution, or with an ointment, on these as well as other portions of the surface of the body — the thighs, groins, and pit of the stomach;† and it has been advised in cases of *intermittent cephalalgia*, and in *iralgia*, to be snuffed up the nostrils.‡

* Dunglison's Amer. Med. Intelligencer, Aug. 1841, p. 26.

† Dr. Schuster, cited in Amer. Journ. May, 1832, p. 242; and Antonini, Journal des Connoissances, Oct. 1838.

‡ B. St. Hilaire, in Gazette Médicale de Paris, Mars 26, 1836.

Recently, Dr. Guastamocchia* has succeeded in arresting intermittents by dissolving eight grains of *sulphate of quinia* in half an ounce of *alcohol*, and rubbing it, in two doses with an interval of a quarter of an hour between them, along the spine. This should be done at the beginning of the cold stage. It very often prevented a single recurrence of the paroxysm.

Mistura quiniæ sulphatis.

Mixture of sulphate of quinia.

- R. Quiniæ sulphat. gr. x.
Acid. sulph. dil. gtt. viij.
Aquæ vel
Aquæ cinnam. f.℥iiss.
Syrup. f.℥ij. M.

Dose. — A table-spoonful.

Syrupus quiniæ sulphatis.

Syrup of sulphate of quinia.

- R. Quiniæ sulphat. gr. xvj.
Syrup. f.℥viiij. M.

Dose. — A spoonful.

Magendie.

Syrupus quiniæ sulphatis compositus.

Compound syrup of sulphate of quinia.

- R. Quiniæ sulphat. gr. xvj.
Acid. sulphur. dilut. gtt. v.
Syrup. limonis, f.℥viiij. M.

Dose. — Same as the last.

* Il Filiatre Sebezio, Agosto, 1841, cited in Brit. and For. Med. Rev. Jan. 1843, p. 236.

Tinctura quiniæ sulphatis.

Tincture of sulphate of quinia.

R. Quiniæ sulph. gr. vj.
 Solve in
 Alcohol. 34° (.847) f.℥j.

Dose. — f.℥j. or f.℥ij., immediately before an attack of *intermittent*.
Magendie.

Guttæ quiniæ sulphatis et opii.

Drops of sulphate of quinia and opium.

R. Quiniæ sulphat. (seu acetat.) gr. xij.
 Solve in
 Alcohol. (seu sp. æther. sulph. comp.) f.℥ss.
 Adde
 Tinct. opii, gtt. xij.

Dose. — Morning and evening, twenty drops, in the *summer fevers* of Europe.
Schmidt.

Pulveres quiniæ sulphatis.

Powders of sulphate of quinia.

R. Quiniæ sulphat. gr. iij. ad. xij.
 Sacchar. ℥ij.
 Misce et fiat pulvis in partes vj. æquales dividendus.

Dose. — A powder morning and evening, in *nervous debility* and in *intermittents*.

Radius* advises, that the powders should be taken in *coffee*, by which means the bitter taste is almost wholly counteracted.

* Auserlesene Heilformeln, u. s. w. S. 186. Leipz. 1836.

Pulveres quiniæ sulphatis et sodæ carbonatis.

Powders of sulphate of quinia and carbonate of soda.

R. Quiniæ sulphat. gr. j.—ij.
Sodæ carbonat. gr. iv.—v.
Sacch. ℥j.

Misce et fiat pulvis.

Dose.—A powder, morning and evening, in *scrophulous ophthalmia*.
Von Ammon.

Pulveres quiniæ sulphatis et antimonii tartratis.

Powders of sulphate of quinia and tartarised antimony.

R. Quiniæ sulphat. gr. x.
Antim. et potass. tartrat. gr. iij.
Sacchar. gr. xxij.

Misce exactè, et divide in partes sex æquales.

Dose.—One, every two hours, during the apyrexia, in cases of *obstinate intermittents*.
*Gola.**

Pulveres quiniæ sulphatis et opii.

Powders of sulphate of quinia and opium.

R. Opii puri, gr. j.
Quiniæ sulph. gr. iij.
Sacchar.
Acac. āā. gr. vj. M. fiat pulvis.

To be taken a short time before the paroxysm in *malignant intermittents*.
Neumann.

Pulveres quiniæ sulphatis et morphiæ sulphatis.

Powders of sulphate of quiniæ and sulphate of morphia.

R. Quiniæ sulph. gr. ij. ad vj.
Morphiæ sulph. gr. ½ ad j.

Divide in dos. iv.

Magendie.

* Annali Univers. di Medicina, tom. 35.

Pulveres quiniæ sulphatis compositi.

Compound powders of sulphate of quinia.

R. Quiniæ sulph. gr. j.
 Cinchon. pulv. gr. xv.
 Rhei pulv.
 Oleosacchar. menth. āā. gr. v.

Misce et fiat pulvis.

Eight of these to be given in cases of *intermittent fever*.
Naumann.

R. Quiniæ sulph. gr. $\frac{1}{4}$.
 Chocolat. gr. viij.
 Sacchar. lact. gr. ij.

Misce. Fiat pulvis tertiis omnibus horis sumendus.

In *debility of the stomach*.

Kopp.

Pilulæ quiniæ sulphatis.

Pills of sulphate of quinia.

R. Quiniæ sulphat. gr. v.—xij.
 Ext. glycyrrhiz. ℥i.

Misce et fiant pilulæ xij.

To be given, according to prescription, in *nervous diseases*.
Radius.

A form for PILLS OF QUINIA is admitted into the Pharmacopœia of the United States :

R. Quiniæ sulphat. ℥j.
 Acaciæ, in pulv. ℥ij.
 Syrup. q. s.

Mix together the sulphate of quinia and the gum ; then beat them with the syrup so as to form a mass, to be divided into four hundred and eighty pills.

Each pill contains a grain of the sulphate.

*Pilulæ quiniæ sulphatis compositæ.**Compound pills of sulphate of quinia.*

R. Quiniæ sulphat. gr. x. — xv.
 Acid. phosphoric. sicc. ℥ij.
 Althææ, (vel rhei,) pulv. ℥iv.
 Ext. centaur. minor. (vel gentian.) ℥ij.

Misce et fiant pilulæ lx.

Dose.—Three to six pills, two or three times a day, in cases of *nervous debility with disposition to hemorrhage*,—as after *abortion*. *Radius.*

R. Quiniæ sulphat. gr. xv.
 Cinnam. pulv. ℥ss.
 Extract. cinchonæ, q. s. ut fiant pilulæ xxx.

Dose.—Four pills every two to four hours. *Henschel.*

R. Quiniæ sulphat. gr. xij.
 Extract. trifol. ℥j.
 Calam. pulv. q. s.

Fiant pilulæ xij.

Dose.—One or two, every two hours. *Hildenbrand.*

*Pulvis sternutatorius ex quiniæ sulphate.**Sternutatory powder of sulphate of quinia.*

R. Quiniæ sulphat. gr. xv.
 Tabaci sternutator. com. ℥j. M.

To be snuffed up the nostrils in the course of five or six days, in cases of *intermittent headach*.

R. Quiniæ sulphat. gr. vj.
 Sacchar. pulv. ℥j.
 Irid. rad. pulv. ℥iss. M,

Small pinches of this to be snuffed up the nose at night. *B. St. Hilaire.*

Unguentum quiniæ sulphatis.

Ointment of sulphate of quinia.

R. Quiniæ sulphat. ℥j.
 Alcohol (38° ad 40°) q. s. (℥ij.)
 Acid. sulphuric. q. s. (gtt. lxxx.)
 Adipis, ℥iv. M.

Half an ounce at a time to be rubbed on the groins in *malignant intermittents*. It may be likewise placed in the axilla.
Antonini.

An ointment composed of ℥j. of *sulphate of quinia* and ℥ij. of *lard*, has been rubbed with success into the axilla in cases of *ague* in children.*

Vinum quiniæ.

Wine of quinia.

R. Quiniæ sulphat. gr. xij.
 Vin. Mader. Oij.

Wine of quinia may, also, be made extemporaneously, by adding two ounces of the tincture to a pint bottle of wine.

CXXIX. QUININÆ ET CINCHONINÆ TANNAS.

SYNONYMES. Chinium Tannicum, Tannas Chinii seu Cinchonicus seu Quinicus, Tannate of Quinia, and Cinchonia.

German. Gerbstoffsaures Chinin, Gerbsaures oder Tanninsaures Chinin

Dr. Otto† has drawn the attention of physicians to the efficacy of the *Tannates of Quinia and Cinchonia*, as recommended by Dr. Ronander, the Secretary to the Swedish Medical Association. He regards them as the most active ingredients in the cinchonas; and affirms, that he has cured by their agency several cases of *obstinate intermittent*, which had resisted the use of sulphate of quinia and other powerful remedies. He found them likewise

* Lond. Med. Gaz. April 3, 1840.

† Dublin Journal of Medical Science, Sept. 1836.

very useful in *typhus* and in states of *general weakness* and *tendency to putrescency*, where sulphate of quinia seemed to be ineffectual. Dr. Ronander's experiments establish the belief, that the tannic acid of the cinchonas may be instrumental in developing their full febrifuge powers.* Tannate of quinia is also a cheaper remedy than the sulphate.

OTHER PREPARATIONS OF QUINIA.

On separating quinia from cinchona by means of acids, a *resinous constituent of the bark* remains behind, which affords no more quinia, but yet possesses considerable febrifuge power, and on that account has been much used by the Dutch physicians. Two grains of this residuum are said to act as well as one grain of quinia. Truessink adduces a series of observations of different physicians, all of which confirm this, and he cites the experience of American physicians with the residuum. According to Dr. Chapman,† a grain of this may be given every two hours during the apyrexia, in the form of pill. Strathing ascribes its efficacy to the quinia still contained in it. In Italy, several physicians have found the mother waters or lees after the preparation of quinia, when boiled to the consistence of syrup, very efficacious in intermittents; and Roux recommends it highly for practice amongst the poor. Buchner advises the lees, evaporated to dryness — which he terms *Chininum Resino-sulphuricum* — to be introduced as a cheap, and, at the same time, efficacious preparation of cinchona, which may be used in charitable institutions, rubbed up with sugar as a powder, or dissolved in alcohol, in place of sulphate of quinia. These experiments and propositions, as Riecke‡ observes, merit more consideration than they have yet received; for quinia, notwithstanding its price is much less than formerly, is yet so dear, that its administration does not adapt it well for charitable institutions, whilst the residue, which possesses valuable properties, is generally thrown away, and in this manner the price of quinia is enhanced.

Sertürner§ thinks he discovered, besides quinia and cinchonia, other alkaloids of cinchona, especially one, which he calls *Chinioidine*, or *Chinoidine*, and which excels, he considers, in medicinal properties, all the other preparations of cinchona. Henry and Delondre — the French chemists — affirm, that chinioidine is

* *Revue Médicale*, Mai, 1837, and *Dunghison's Amer. Med. Intelligencer*, Oct. 16, 1837, p. 270.

† *Elements of Therapeutics*, 6th edit. ii. 292. Philad. 1831.

‡ *Die neuern Arzneimittel*, u. s. w. S. 130.

§ *Hufeland's Journal*, Jan. 1829.

nothing more than quinia, cinchonia, and a peculiar yellow resinous matter, intimately adherent to that alkaloid. It appears, also, from the experiments of different physicians with the presumed new alkaloid, that it essentially resembles the preparations already mentioned in its medical properties.* A *Resina Chinæ Præparata* is recommended by Plagge, which is prepared from the mother waters or lees of quinia, by means of precipitation by a carbonated alkali, extraction by alcohol, and removal of the alcoholic liquor by distillation. It is said, likewise, to possess markedly curative powers in *intermittents*.

The Pharmacopœia of the United States of 1830 gave a formula under the title *QUINÆ SULPHAS IMPURUS*, which consisted in evaporating the liquor poured off the crystals of sulphate of quinia to the consistence of a pilular mass. This has been known for years in Philadelphia under the name of *EXTRACT OF QUINIA*, and its active ingredients appear to be sulphate of quinia and sulphate of cinchonia, which are prevented from crystallising by a peculiar resinoid substance united with them.

Dr. Wood† asserts, that he has seldom found intermittents resist twenty-four grains of the impure sulphate, given between the paroxysms; although a larger quantity may be employed with safety and greater certainty of success. The Author has never prescribed it.

CXXX. SALICINA.

SYNONYMES. Salicinum, Salicinium, Salicine, Salicin.
German. Salicin, Weidenstoff, Weidenbitter.

The tonic virtues of the bark of the willow have been known for ages, and it has been regarded as one of the best substitutes for cinchona in eleemosynary institutions. It was not much valued, however, in more modern times, until the discovery of an active principle in it again attracted to it the attention of practitioners. This discovery, if not made, was perfected, by Leroux,‡ an apothecary at Vitry, in France, who first obtained salicin in a pure state in 1828, after it had been procured in an impure form by some German and Italian chemists.§ It is prepared, by

* See Radius, *Auserlesene Heilformeln*, S. 191, Leipz, 1836, and Lincke, *Vollständiges Recept-Taschenbuch*, i. 455, Leipz. 1840.

† Wood and Bache's *Dispensatory*, 4th edit. p. 1032. Philad. 1839.

‡ *Annales de Chimie*, &c. xliii., and *Journal de Chimie Médicale*, tom. vi.

§ *Dictionnaire de Mat. Méd.* par Mérat and De Lens, art. Salicine.

preference, from *Salix helix*, but it is found likewise in the barks of other willows—*Salix alba*, *S. vitellina*, *S. purpurea*, *S. Lamber-tiana*, *S. pentandra*, *G. polyandra*, *S. fragilis*, *S. viminalis*, &c., and in the leaves and barks of several varieties of poplar, *Populus tremula*, *P. tremuloides*,* *P. alba*, and *P. Græca*.†

METHOD OF PREPARING.

According to the method of Leroux, three pounds of dried and powdered *willow bark* (*salix helix*) are boiled for three-quarters of an hour in fifteen pounds of *water*, to which four ounces of *carbonate of potassa* have been added. To the cold decoction are added two pounds of *liquid subacetate of lead*. The mixture is permitted to settle, is filtered, treated with *sulphuric acid*, and the remaining lead precipitated by a stream of *sulphuretted hydrogen gas*. The excess of acid is neutralised by *carbonate of lime*: the mixture is again filtered, the fluid inspissated and neutralised by *dilute sulphuric acid*. It is deprived of its colour by *ivory black*, and filtered whilst boiling. It is then twice crystallised — if still coloured after the first crystallisation — and dried in the dark. This process yields about an ounce of salicin.

Braconnot‡ obtains it by adding *subacetate of lead* to a *decoction of the bark*, precipitating the excess of lead by *sulphuric acid*, evaporating the colourless liquid that remains, adding near the end of the process a little *animal charcoal* previously washed, and filtering the liquor while hot. The salicin is deposited, on cooling, in a crystalline form.§

The following plan has been advised by Messrs. Fisher and Tyson, of Baltimore.|| *Willow bark* is boiled with *caustic lime* in *water*; the decoction is filtered and *sulphate of zinc* added, so long as it produces a precipitate. The liquid, having been again filtered, is evaporated to the consistence of an extract, and the residue is treated with *alcohol*. The tincture, thus obtained, if carefully evaporated, yields crystals of salicin, which may be purified by washing with a saturated solution of the same principle in cold water.

Salicin forms very fine silky masses of white crystals, which have the appearance of mother-of-pearl. It bears a distant re-

* See Mr. L. Turnbull, On *Populus tremuloides*, White Poplar or American Aspen, in Amer. Journ. of Pharmacy, Jan. 1843, p. 275.

† Riecke, Die neuern Arzneimittel, S. 365, and 2te Auflage, t 72. Stuttgart, 1840.

‡ Journal de Chimie Médicale, Janvier, 1831.

§ For Peschier's method, see Annales de Chimie, vol. xlv., and Amer. Journ. Med. Sciences, May, 1831, p. 256.

|| Journal of the Philadelphia College of Pharmacy, iii. 214.

semblance to sulphate of quinia, yet it is not so loose and delicate. It is permanent in the air, inodorous, and has a strong, enduring bitter taste, with a striking accompanying balsamic flavour, like the bark of the willow.* One hundred parts of cold water dissolve six parts of salicin. In warm water, it is more soluble, and also in alcohol; but it is not soluble either in ether or the essential oils. It exhibits no alkaline reaction. By admixture with sulphuric acid, salicin acquires a beautiful red colour.†

EFFECTS ON THE ECONOMY.

The well known effects of the barks of the willows gave occasion to the immediate employment of salicin in cases of *intermittent fever*. Miquel‡ appears to have been one of the first — if not the first — who instituted experiments with it; and he satisfied himself, that it merits a distinguished place amongst our febrifuge agents, although it requires larger doses than quinia. Soon afterwards, it was given by other physicians — by Husson and Bally, Girardin, Magendie, Andral, Blaincourt, Graff, Linz, Stegmayer, Amelung, Stam, Van Sneek, Blom, Gräfe, Von dem Busch, Krombholz, Pleischl, and others.

The sentiments, respecting its value, are discrepant; some classing it far beneath quinia, whilst others assign it even a higher position. Its general properties are certainly analogous to those of quinia; but it in no respect merits a preference,§ not even in the article of price: for, although an equal weight of salicin may cost less, it requires so much more to produce the same effect, that the cost is perhaps equal. Still, as M. Pleischl,|| of Prague, has suggested, even if salicin were much the dearer of the two, it might be better to use it, because it is of home manufacture, and can be obtained in war as well as in peace.

* MM. Pérouze and Jules Gay Lussac, in *Annales de Chimie*, vol. xlv.

† For an elaborate account of the chemical relations of salicin, see M. R. Piria, *Annales de Chimie et de Physique*, Novembre, 1838.

‡ *Gazette Médicale de Paris*, Janv. 1830; see, also, *Annales de Chimie*, xliii. and xlv.

§ Richelot, in *Archives Générales de Médecine*, Sepr. 1833: see, also, Prof. Dierbach, in *Heidelb klinisch. Annal. B. x. H. 1. S. 62. Heidelb. 1834.*

|| *Medicinisch. Jahrbücher des k. k. ö. Staat. 1835*; and *Br. and For. Med. Rev.* for April, 1836, p. 576.

MODE OF ADMINISTERING.

The ordinary dose of salicin, in a case of *intermittent*, is about four or six grains every three hours during the period of intermission; in the *febres larvatæ*, or masked fevers, smaller doses may be given; but in the very violent fevers at Calvi, in the Island of Corsica, Levy found it often necessary to give from forty to fifty grains in twenty-four hours. Of thirty cases of quotidian and tertian intermittents, twenty were cured by the use of salicin; ten required afterwards the sulphate of quinia. He considers it preferable to sulphate of quinia in intermittents that are accompanied by irritation in the primæ viæ: he never saw it rejected or produce vomiting; and in cases of manifest irritation of the digestive tube, it has been borne perfectly well.*

Salicin is generally given in intermittents, in the form of powder. In other affections, to obtain its febrifuge or tonic agency, one or two grains may be given four or five times a day — gradually augmenting the dose.

In cases of *asthenia of the digestive organs*, Von dem Busch prescribes a powder of salicin and sugar with the addition of cinnamon; and lozenges of salicin, sugar, gum arabic, and oil of peppermint. In cases of *copious secretion from the mucous membranes*, especially in *chronic bronchitis* and *leucorrhæa*, he directs salicin to be combined with a decoction of polygala amara, or of lichen Islandicus. In *intermittents*, Stegmayer advises it to be associated with small doses of tartrate of antimony and potassa.

Pilulæ salicinæ.

Pills of salicin.

R. Salicin.

Ext. gentian. āā. gr. xxiv.

Glycyrrh. pulv. q. v.

ut fiant pilulæ xij.

Vavasseur.

* Archives Médicales de Strasbourg, and Gazette Médicale de Paris, Févr. 25, 1837.

Pulveres salicinæ.

Powders of salicin.

R. Salicin. gr. xij.

Sacch. ʒij. Misce

et fiat pulvis in partes iv. æquales dividendus.

Dose. — One, three times a day.

Krombholz.

Pulveres salicinæ compositi.

Compound powders of salicin.

R. Salicin. gr. xv.

Antim. et potass. tartrat. gr. j.

Sacchar. ʒiiss. Misce

et fiat pulvis, in partes x. æquales dividendus.

Dose. — A powder, every two hours.

Stegmayer.

Mistura salicinæ.

Mixture of salicin.

R. Polygal. amar. rad. ʒvj.

Coque cum aquæ f. ʒxij. ad remanent. f. ʒviij.

Colaturæ adde

Salicin. gr. viij. ad. x. M.

Dose. — One or two spoonfuls every two hours.

Von dem Busch.

CXXXI. SAPO MOLLIS.

SYNONYMES. Sapo Viridis, S. Niger, S. Kalicus, S. Domesticus mollis, Sapo ex Olivæ Oleo et Potassâ confectus, Kali elainicum.

French. Savon Noir, Savon Mou, Savon à base de Potasse.

German. Schmierseife, Grüne Schmierseife, Käufliche Kaliseife, Schwarze Seife, Olsäures Kali.

Under this name a soap is used, which is formed by a union of oil with potassa. It is the "*sapo ex oleo et potassâ confectus*" of the London Pharmacopœia, has of late years been brought for-

ward in Germany as a remedial agent in cases of *itch*,* and has been employed in many hospitals.

MODE OF ADMINISTERING.

The treatment of *itch* by soft soap is directed by Pfeuffer to be carried into effect in the following manner.

Attention is paid to the general health of the patient for a day before the soap is applied. His whole body, with the exception of the head, face, and genital organs, is then besmeared with it, and the application is repeated, morning and evening, for six days. At first, two rubbings, of from four to six ounces, are used : at the third and fourth, from two to three ounces ; and from the fifth to the seventh inclusive, from half an ounce to an ounce ; but after this, the soap is applied only to those parts which are affected with the eruption or itching. On the eighth day the patient takes a bath of tepid soap and water ; and the body and bed linen, which have not been shifted during the cure, may now be changed for cleaner. In dry and warm seasons, the patient is able to leave the infirmary on the tenth day, cured ; but in moist and cold, not until the twelfth or fourteenth. The cure of the eruption is generally effected in seven days, that is, by fourteen rubbings. During the period of treatment, the patient must remain in bed, avoid exposure to draughts of air, and reside in a chamber, whose temperature is from 73° to 77° of Fahrenheit.

On account of the strong smell of the soap, not more than ten patients ought to be allowed to occupy the same room. A full diet may be allowed them.

From six to eight hours after the first or second rubbing, a sense of tension and pricking is felt in the skin, which, at times, gradually augments until it amounts to a feeling of burning heat. About the fifth or sixth rubbing, the skin appears of a scarlet hue, without the temperature being materially elevated. In several cases, irritative fever ensues, which disappears in the course of twenty-four hours, with augmented secretion of urine. Miliary vesicles form in groups; sweating takes place freely ; the sleep, which may have been disturbed for a night or two, recurs ; the skin desquamates, and the patient does not find his strength in the least exhausted. Should the inflammation of the skin occur earlier than the sixth rubbing, the friction must be pretermitted. Pfeuffer, however, never observed this to be the case.

In *scrophulous* and *syphilitic dyscrasies*, the friction may have

* Pfeuffer, Beobachtungen über die Krätze und ihre Behandlung durch die Schmier-oder grüne Seife. Bamberg, 1833.

to be repeated once more, and the patient may have to remain from two to four weeks in the institution.

It very generally happens, that this plan excites inflammation of the skin and desquamation of the cuticle : when this is not the case, no change whatever is produced in the eruption.

In order to mitigate the distressing feeling of burning produced by the rubbing, one part of flowers of sulphur may be added to two parts of the soft soap.

In those cases, in which the disease has existed for years, with greater or less intervals, and in those who were strumous in their youth, or were at a subsequent period affected with syphilis ; — in all cases, indeed, in which the cutaneous affection has become, as it were, habitual, Pfeuffer directs, that a cathartic should be premised, and that in the course of the cure, a quart of the decoction of the woods should be taken.

This mode of treatment, according to Pfeuffer, is contraindicated by febrile conditions, especially of the synochal kind ; by acute cutaneous affections ; pulmonary and abdominal catarrhs ; pulmonary and abdominal phthisis ; chronic headach ; and hereditary or acquired tendency to epilepsy. In such cases he prefers the internal and external use of sulphur : and, after the cure, the establishment of issues.

The great recommendation of this plan of treatment, in hospitals and infirmaries, is said to be its cheapness, although it strikes us, that there cannot be any marked difference in this respect between it and the treatment by sulphur, which is greatly used, on this very ground, in many of the eleemosynary establishments of Germany at this time.*

The efficacy of Pfeuffer's plan of treatment has been confirmed by numerous observers, — by Graff, Bermann, and Cramer, who is said to have first recommended the soap in scabies ; and by Sicherer, Seyffer, Cless, and others, all of whom agree as to its excellence : they regard it as one of the best methods of treatment in use. The soft soap forms an ingredient in many of the officinal and other itch ointments.†

* H. Vezin, Ueber die Krätze und ihre Behandlung nach der Englischen Methode. Osnabrück, 1836. See, also, Dunglison's American Medical Intelligencer, Aug. 15, 1839, p. 158.

† Riecke, Die neuern Arzneimittel, u. s. w. 2te Auflage, S. 584. Stuttgart, 1840.

CXXXII. SODA CHLORINATA.

SYNONYMES. Sodæ Chloridum, S. Chloruretum, S. Hypochloris, Chloruretum Oxidi Sodii, Sodæ Oxymurias, Natrum Chloratum, N. Chloricum, N. Oxymuriaticum, Chlorinated Soda, Chloride of Soda, Hypochlorite of Soda, Chloruret of Soda, Chlorite of Soda, Oxymuriate of Soda.

French. Chlorure de Soude, Chlorure d'Oxide de Sodium.

German. Chlornatron.

This preparation resembles in almost all respects chlorinated lime. Both it and chlorinated potassa were associated by Berthollet under the common name *Eau de Javelle*, or 'bleaching liquor'; and it has of late generally received the name of *Liquor de Labarraque*, or *Labarraque's Soda Disinfecting Liquid*.

METHOD OF PREPARING.

Labarraque* recommended it to be prepared directly by passing a current of chlorine gas into a solution of carbonate of soda.

The following is the formula in the last London Pharmacopœia, for the *Liquor Sodæ Chlorinatæ*, *Liquor Sodæ Chloridi*, *L. Sodæ Oxymuriaticæ*, *L. Chloreti seu Chlorureti Natri seu Sodæ*, *Natrum Chloratum Liquidum*, *L. seu Aqua Natri Oxymuriatici*, *Hypochloris Sodici Aquâ Solutus*; German, *Oxydirt salzsaures Natronwasser*, *Chlorsodaflüssigkeit*, or *Labarraque's Disinfecting Liquid*. "Take of *Carbonate of soda*, a pound; *Distilled water*, forty-eight fluid ounces; *Chloride of sodium*, four ounces; *Binoxide of manganese*, three ounces; *Sulphuric acid*, four ounces. Dissolve the carbonate of soda in two pints of the water; then put the chloride of sodium and binoxide of manganese, rubbed to powder, into a retort, and add to them the sulphuric acid, previously mixed with three fluid ounces of water, and cooled. Heat and transmit the chlorine first through five fluid ounces of water, and afterwards into the solution of carbonate of soda above directed."

The following form is given in the last edition of the Pharmacopœia of the United States (1842):—"Take of *Chlorinated lime*, ℥j.; *Carbonate of soda*, ℥ij.; *Water*, a gallon and a half. Dissolve the carbonate of soda in three pints of the water, with the aid of heat. To the remainder of the water add, by small portions at a time, the chlorinated lime,

* Gazette de Santé, April 25, 1826.

previously well triturated, stirring the mixture after each addition. Set the mixture by for several hours, that the dregs may subside ; then decant the clear liquid, and mix it with the solution of carbonate of soda. Lastly, decant the clear liquor from the precipitated carbonate of lime, pass it through a linen cloth, and keep it in bottles secluded from the light."

When the solution of chlorinated soda is properly prepared, it is devoid of colour ; has a sharp, saline, and astringent taste, and an odour of chlorine. By careful evaporation, it yields crystals, which produce the original liquid when re-dissolved. When the solution is exposed to the air, and allowed to evaporate spontaneously, it gives out chlorine, and yields crystals of carbonate of soda.*

EFFECTS ON THE ECONOMY.

In its general remedial agency, chlorinated soda resembles chlorinated lime, and has been administered both internally and externally in the same cases. It is preferred, however, for internal, whilst chlorinated lime is generally chosen for external use, and this, chiefly perhaps, owing to its being obtained more conveniently, and cheaply. Dr. Pereira states, however, that he has carefully prepared and tried the two chlorides, and gives a decided preference to the chloride of soda. Labarraque, likewise, preferred it as an antiseptic, on the ground, that by the process of disinfection, it becomes chloride of sodium, which is not a deliquescent salt ; whilst chloride of calcium, formed by chloride of lime, attracts water from the atmosphere, and thereby furnishes one of the conditions — moisture — necessary to the putrefractive process. Hence, he thinks, whilst chloride of lime will serve equally well for simple disinfection, chloride of soda is to be preferred where we wish at the same time to prevent a renewal of putrefaction.†

By Bouillaud, Chomel and others, chlorinated soda has been given, with advantage, in *typhous fevers* ; and by Kretschmar,‡ Lalesque, Colson, and Gouzee§ in *intermittents* :|| ten cases are reported by the last named gentleman ; in two, the intermittent yielded immediately ; two others were cured after a slight return ; in one, there were four attacks, gradually diminishing ; in

* Faraday, Quarterly Journal of Science, N. S. ii. 84, cited by Brande, Dictionary of the Materia Medica, p. 508, Lond. 1839.

† Pereira, Elements of Materia Medica 2d edit. p. 540, Lond. 1842 ; or Amer. edit. by Dr. Carson, Philad. 1843.

‡ Venus, Grundriss der medicin. Receptirkunst, S. 67. Weimar, 1838.

§ Revue Médicale, Février, 1836.

|| Riecke, Die neuern Arzneimittel, S. 334, and 2te Auflage, S. 511. Stuttgart, 1840.

two cases, the severity of the paroxysms abated, but it was thought necessary to have recourse to sulphate of quinia; in two others, no effect was produced, and in one, the disease was aggravated. Gouzee infers, that these cases prove the febrifuge properties of chlorinated soda to be less marked than those of sulphate of quinia, and, therefore, that it ought not to be trusted to, except in the slighter cases, and where the patients are easily susceptible of the effects of medicine, — as women and children.

In like manner, it has been found useful in *scrophulous affections*, and in various diseases in which chlorinated lime has proved serviceable. See CALX CHLORINATA.

MODE OF ADMINISTERING.

From ten drops to a dram, mixed with plain or sugared water, may be given internally for a dose.

The form in which it was prescribed by Gouzee, in *intermittents*, was a mixture, composed of half a dram to four ounces of distilled water. This wastaken by spoonfuls during the apyrexia; so that the last dose should be swallowed shortly before the next paroxysm was expected. The patients were restricted to their beds, or at least to their chambers.

When applied externally, it is rarely used pure or diluted with so little as one-half water, except in cases of *asphyxia*, and *gangrene*, and for dressing *old ulcers*, &c. Most commonly it is diluted with ten to thirty parts of water, and in this strength is applied to *ulcers* of various kinds, *burns*, *cutaneous diseases*, &c. When used as a disinfecting agent, it is generally diluted with ten, twenty or thirty times its weight of water.*

STRYCHNIA ET EJUS SALES.

SYNONYME. Strychnia and its salts.

CXXXIII. STRYCH'NIA.

SYNONYMES. Strychnina, Strychnium, Strychninum, Strychnia, Strychna, Strychnine, Vauqueline.

French. Strychnine.

German. Strychnin, Krähenaugenstoff, Krähenaugenbitter.

This alkaloid was discovered by Pelletier and Caventou,† in *nux vomica*, St. Ignatius's bean, *upas tieuté*, and in the wood

* Payan, *Revue Médicale*, Aout, 1839.

† *Annales de Chimie*, tom. viii. ix. and x.

of *strychnos colubrina*; and experiment has shown, that these substances are indebted for their medicinal properties to it.*

In those different substances, strychnia is found associated with another principle analogous to it in its properties — brucia.† In St. Ignatius's bean, there is less brucia than in *nux vomica*, so that it is best adapted for the preparation of strychnia; but it is not as easily obtained, and consequently *nux vomica* is almost always — if not always — used.

METHOD OF PREPARING.

According to one form of preparation, a solution of liquid *subacetate of lead* is added to a solution of the *alcoholic extract of nux vomica* in water, until a precipitate is no longer thrown down; the foreign matters being thus precipitated, the strychnia remains in solution with a portion of colouring matter, and sometimes an excess of acetate of lead. The lead is now separated by *sulphuretted hydrogen*; and the fluid is filtered and boiled with *magnesia*, which unites with the acetic acid, and precipitates the strychnia. The precipitate is next washed in cold water, and redissolved in *alcohol* to separate it from the excess of magnesia, and by evaporating the alcohol, the strychnia is obtained. If it be not perfectly white, it must be redissolved in acetic, or hydrochloric acid, and be reprecipitated by means of magnesia.

The modes of preparation recommended in the Pharmacopœias of London, Edinburgh, and the United States, differ from each other. The following is that contained in the last work (1842):— Take of *Nux vomica*, rasped, ℥iv.; *Lime*, in powder, ʒvj.; *Muriatic acid*, fʒij.; *Alcohol, Dilute sulphuric acid, Solution of ammonia, Purified animal charcoal, Water*, each a sufficient quantity. Digest the *nux vomica* in two gallons of water, acidulated with a fluid ounce of the muriatic acid, for twenty-four hours; then boil for two hours, and strain with expression through a strong linen bag. Boil the residuum twice successively in the same quantity of acidulated water, each time straining as before. Mix the decoctions, and evaporate to the consistence of thin syrup; then add the lime previously mixed with a pint of water, and boil for ten minutes, frequently stirring. Pour the mixture into a double linen bag, and, having washed the precipitate well with water, press, dry, and powder it. Treat the powder repeatedly with boiling alcohol until deprived of its bitterness; mix the liquors; and distil off the alcohol by means

* Magendie, *Annales de Chimie*, x. 176, 1819.

† See page 111.

of a water bath. Mix the residue with water, and, having applied heat, drop in sufficient diluted sulphuric acid to neutralise and dissolve the strychnia; then add purified animal charcoal, boil for a few minutes, filter, evaporate and crystallize. Dissolve the crystals in water, and add sufficient solution of ammonia to precipitate the strychnia. Lastly, dry the precipitate on bibulous paper.*

As thus prepared, it is in the form of a white powder.

Strychnia, obtained by crystallisation from an alcoholic solution, which has been diluted by means of a small quantity of water, and left to itself, appears under the form of microscopic crystals, constituting four-sided prisms, terminated by pyramids with four flattened or depressed faces. When crystallised rapidly, it is white and granular, is insupportably bitter to the taste, and leaves an after taste similar to that caused by certain metallic salts; it has no smell, and is not changed by exposure to the air; is neither fusible nor volatile; for, when subjected to the action of heat, it does not fuse until the moment of its decomposition and carbonisation, and it is decomposed by a degree of heat inferior to that which destroys most vegetable substances. When exposed to the naked fire, it swells, becomes black, and yields an empyreumatic oil, a little water, acetic acid, carbonic acid, and carburetted hydrogen. Distilled with deutoxide of copper, it gives out much carbonic acid, and only slight traces of azote. It is composed, therefore, of oxygen, hydrogen and carbon.

Although strychnia has so strong a taste, it is scarcely soluble in water. At 50° Fahr., 6667 parts of water dissolve but one of it; boiling water dissolves a little more than double, so that it may be said to be soluble in 2500 parts of boiling water. It is remarkable, however, that a solution made in the cold, and containing, therefore, only $\frac{1}{6667}$ th part of its weight, may be diluted 100 times, and still retain a very decidedly bitter taste. It is more soluble in strong alcohol, little so in weak, and not much so in ether or fixed oils, although they acquire a bitter taste from it. On the other hand, it is very readily soluble in volatile oils, and the hot saturated solution, on cooling, deposits crystals. It has an alkaline reaction, and forms, with acids, salts which are mostly crystallisable, and insupportably bitter, and are more soluble than pure strychnia.†

Strychnia, being sold at a high price, is liable to adulteration. A respectable druggist of Philadelphia informed the author, that one of his customers was offered strychnia by another house at a price considerably below what he had to pay for it when pur-

* Pharmacop. of the United States, p. 184. Philad. 1842.

† Magendie's Formulaire, &c.

chased even in large quantities from respectable sources. He purchased an eighth of an ounce of it at the rate of five dollars the ounce; when pure strychnia could not be afforded at less than nine dollars per ounce. Some of this was tested, when it was found to consist of equal parts of flour or starch, and pure strychnia.

EFFECTS ON THE ANIMAL ECONOMY IN HEALTH.

The effects of strychnia on man and animals resemble, on the whole, those of the spirituous extract of *nux vomica*, except that they are more intense. According to Magendie, one-eighth of a grain is sufficient to kill a strong dog. Pope, who made experiments on dogs, found, that $\frac{1}{12}$ th of a grain was enough to paralyse the lower limbs of a small dog in four or five minutes, and in half an hour to kill it. Christison* considers strychnia the strongest poison after hydrocyanic acid. He injected a solution of a third of a grain in alcohol into the thorax of a wild boar, and in ten minutes the animal died. A dog was destroyed by $\frac{1}{6}$ th of a grain in two minutes; and he believes, that the same effect would be induced on man by half a grain introduced into a wound.

Lembert† observed similar results from placing a grain in the thorax of a small dog, and from three grains introduced into the cellular tissue of a larger animal, on which tetanic spasms were induced in the thoracic muscles.

Mr. Blake‡ injected a grain of strychnia, dissolved in a small quantity of acetic acid, into the veins of a dog. The first effect of the poison was to induce general convulsions in about thirty seconds after its injection, the action of the heart being at the same time rendered irregular, which Mr. Blake presumes was owing to the convulsive struggles of the animal. All external signs of life ceased in about a minute and a half after the injection of the poison — the heart still continued to beat. He found, that when strychnia was introduced into the circulation in so small a quantity as not to produce any general symptoms, it did not appear to exert the least influence on the heart.

That the action of strychnia is analogous to that of *nux vomica*, has been proved by the experiments of Ségalas,§ Andral,|| Bard-

* Treatise on Poisons, 3d edit. Edinb. 1836; and Dispensatory, p. 895. Edinb. 1842.

† Essai sur la Méthode Endermique, Paris, 1828, 8vo.

‡ Edinburgh Medical and Surgical Journal, Apl. 1839, p. 338.

§ Magendie's Journal de Physiologie, ii. 4.

|| Ibid. Juillet, 1823.

sley,* Redlich, Sandras, Lüders, Hennemann, and numerous others.† It affects especially the spinal marrow, and the ganglionic system — less strikingly the brain; small doses excite the ganglionic system; larger, the spinal marrow; consequently, it has been imagined, that it might be an efficacious remedy in nervous diseases, which are dependent upon spasmodic disorder in the ganglionic system, or on diminished sensibility and torpor of the nerves of motion.

The following are the effects observed by Oppler from the internal use of nitrate of strychnia:— a sensation of warmth and itching in the epigastrium: eructation; nausea; vertigo; slight excitement like that of intoxication; great vividness, with more or less confusion of mind; dull pain over the eyes; spots before the same; dilatation of the pupils; diplopia; tinnitus aurium; difficult articulation and deglutition; slight trismus; sense of formication in the paralysed parts; convulsive motions or twitchings, at times, in those parts; at others, over the whole body, similar to electric shocks; tremors of the muscles; occasionally, violent spasms; tetanus; asthma; palpitations; febrile heat; general sweating; prostration; pale or livid countenance; pulse sometimes full and frequent, at others small and contracted; great sensibility over the whole body; involuntary laughter, succeeded always by difficulty of breathing and convulsions. The sleep was generally interrupted by convulsions; the secretion of urine scanty, and occasionally suppressed. These symptoms came on gradually, and disappeared in the same manner, when the dose was moderate, in the course of some hours. Large doses induce death by a sudden shock to the nervous system; smaller doses, when continued for a long time, may destroy by causing apoplexy, of which Oppler saw many examples in his experiments on animals.‡

Dr. Blumhardt§ has published a case of poisoning by strychnia, which occurred to him in Stuttgart. He was called to a young man, seventeen years old, who had swallowed two scruples of strychnia after dinner. A short time afterwards, experiencing great restlessness, he repented of what he had done, and immediately took four grains of tartar emetic, which excited considerable vomiting. When the physician arrived, about a quarter of an hour after he had taken the strychnia, he found the patient on his back in bed, with his head thrown back, rigid

* Hospital Facts and Observations, Illustrative of the Efficacy of Strychnia, Brucia, &c. Lond. 1830.

† Pétrequin, *Gazette Médicale de Paris*, No. 44, Nov. 1838.

‡ See, also, Tanquerel des Planches, *Essai sur la Paralyisie de Plomb*. Paris, 1834.

§ Medicinisch. Correspondenz-Blatt, in *Encyclog. des Sciences Médicales*, Sept. 1837.

and incapable of motion, but with a constant inclination to turn towards the right side. He could only move the upper limbs freely. The countenance was pale and haggard; the temperature of the skin natural, and the pulse quick and contracted. Consciousness remained unaffected; the speech was rendered difficult by an occasional contraction of the muscles that move the lower jaw; but it could not properly be said to be interrupted; deglutition was untouched. The trismus, however, became more and more frequent and violent, and the respiration thereby unequal and suspended; the pulse was small, suppressed and quick. The remedies — employed to save him — as the tincture of iodine and the acetate of morphia, were of no avail. With the periodical trismus was now associated spasmodic agitation of the whole body, to which — after a short interval — succeeded opisthotonos with violent symptoms of suffocation; the trismus attained the highest degree, and the upper extremities were deprived of the influence of volition. With the increase of the general tonic spasm, the respiration was always more difficult and oppressed, and for a time wholly ceased; the pulsation of the heart and arteries became irregular, less distinct, and at length imperceptible. In this condition the skin acquired a bluish appearance; the countenance was puffed, and of a violet hue; the lips dark blue, the neck swollen, the eyes protruded, fixed and directed towards the right side; the pupils enlarged and immovable, and the conjunctiva injected. At this period, the patient was entirely unconscious; but from this condition he awoke once, and all the symptoms became mitigated; during this remission, the muscles, influenced by the spinal marrow, remained cramped, except the upper extremities, which could be moved voluntarily. In a quarter of an hour, the tetanic attack returned in its violence, with intense commotion of the whole body; this ended in asphyxia, from which he again recovered to consciousness. The same thing happened in a third attack. In the fourth, he succumbed under the power of the poison. The whole scene, from the taking of the poison to the occurrence of death, lasted an hour and a half.

During the last attack, as doubt existed whether he were really dead, the median vein of the left arm, which was turgid, was opened, and after the vessel was emptied of its thick, black blood, which resembled that of an animal, several bubbles of air, from the size of a pea to that of a small cherry, were forced out by pressure.

The dissection was made twenty hours after death. In spite of the elevated summer heat there were no signs of putrefaction: the whole of the body was uncommonly rigid. The muscles of the back were of a brownish-red colour, almost like that of smoked meat. On opening the spinal canal, a considerable

quantity of thick, dark coloured blood, like that of an animal, flowed out.

The *plexus venosi spinales* were turgid with the same kind of blood, as well as the vessels of the pia mater. Under this membrane, especially in the cervical portion, some watery fluid was effused. The upper portions of the spinal marrow were soft, even pappy in some places, but lower down it became gradually harder. Within the cavity of the cranium, the same turgid condition of vessels existed; all the veins of the dura mater appeared as if injected; the veins of the pia mater were likewise engorged; and the whole mass of the brain indicated an unusual supply of blood, so that the cortical substance appeared quite blue. The cerebellum was softer than usual. In the cavities of the abdomen and thorax, a striking poverty of blood was perceptible. The heart was shrunken and empty, as well as the large vessels of the thorax. The stomach was full of solid food, which appeared to have undergone no change; its bloodvessels contained a considerable quantity of blood, and the mucous coat exhibited marked redness over its whole surface; but this was especially concentrated about the cardia and the fundus; the small intestine was likewise redder than natural, as is commonly the case in those who have died whilst digestion was going on.

The liver was tolerably supplied with blood; the gall-bladder empty.

When strychnia is used endermically, as is not unfrequently done, the course of the phenomena is somewhat different. G. H. Richter employed it in this way in many cases of hemiplegia, in one of which it occasioned symptoms of actual poisoning. When the dose exceeded a quarter of a grain, a feeling arose in the part to which it was applied as if needles were run into the skin; this gradually spread over the whole limb; the temperature of the body was augmented; the pulse was quickened, full and hard; the breathing constrained; pain was experienced in the same side of the head; the secretion of urine was increased, and a general perspiration broke out, which persisted for about an hour, after which the pricking of the surface, and the excitement of the vessels ceased. To these symptoms — and seldom later than two hours after the application of the agent — convulsive movements succeeded in the paralysed limbs like those induced by electricity, which augmented in violence and frequency with the increase of the dose, — being strongest and most severe during the night, at which time the limbs were moved involuntarily. When awake, a feeling of stiffness was experienced in all the limbs, which passed off when they were used. On digestion, defecation, and the appetite, the nitrate of strychnia seldom exerted any influence. Only in one case — in which no effects were induced on the nervous system, when the dose was gra-

dually carried to three grains — was obstinate constipation produced. In general, when it was begun with in the dose of one-eighth of a grain, and on the next day one-fourth was given, on the third day one-half, and afterwards the dose was increased daily by one-fourth of a grain, until one and a quarter were given, — the following unpleasant symptoms supervened. The patient experienced twitchings earlier than before, and first in the paralysed limbs. As these became, from minute to minute, more violent, a penetrating pain was felt in the occiput, with vertigo and tinnitus aurium. The twitchings now extended over the affected arm, and, subsequently, to the sound side, whereupon the vertigo and headach augmented, and insensibility, with difficult and stertorous breathing, ensued. The pulse now became very full, hard, slow, and intermitting; the countenance bluish-red and turgid; the paralysed lower extremities of a marbled blue; the pupils very much dilated, and the mouth open, — the convulsions being occasionally so strong as to toss him to and fro on the bed. When these phenomena declared themselves, Richter removed the dressing from the surface, which appeared inflamed, and still contained a quantity of strychnia, that had not been absorbed; the parts were then washed, and sprinkled immediately — according to Lemberťs and Lesieur's recommendation — with two grains of the acetate of morphia; the face was washed with cold water, the soles of the feet brushed, and other excitants administered.*

Dr. Christison† considers, that strychnia is not a cumulative poison; yet the Author has seen one or two cases, which would favour the contrary opinion.‡

* Morphia appears to be the most powerful antidote: under its use, the dangerous symptoms rapidly disappear, consciousness returns; the patient sleeps for some hours, and a general perspiration breaks out, after which he awakes with a feeling of dulness, and with stiffness of the limbs, which soon, however, vanish. In respect to the topical application of strychnia by the endermic method, A. L. Richter§ remarks, that the preparations of strychnia produce much more powerful local effects than those of morphia; they maintain the abraded portions of the skin in an inflamed state, promote suppuration more than morphia, and occasion violent itching and burning, with a feeling as if needles were run into the skin.

* See some experiments, relative to the action of strychnia on the nervous system, by Dr. H. Stannius, in Müller's Archiv. Heft. ii. 1837; and Brit. and For. Med. Review for Jan. 1838, p. 221.

† Dispensatory, p. 895. Edinb. 1842.

‡ See, also, Pereira, Elements of Mat. Med. and Therap. ii. 1310, Lond. 1842; or Amer. edit. by Dr. Carson, Philad. 1843.

§ Die Endermatische Methode, u. s. w. Berlin, 1835.

Artus recommends, from his investigations, pure baryta (*Ætzbaryt*) as an antidote. It forms an insoluble precipitate with strychnia, and he esteems it to be more certain than the tinctures of iodine and bromine recommended by Donné,* the chloride of barium, or the infusions of tar and galls recommended by Raspail.†

The effects, referred to above, were chiefly obtained from the administration of the nitrate of strychnia, but they may be esteemed applicable to all the preparations of strychnia, as we know nothing of any difference in their agency. It is probable, however, that the salts of strychnia, owing to their greater solubility, may have more action than strychnia itself, although the muriatic, and acetic, or lactic acids, which are almost always present in the stomach, it might be presumed, would readily unite with it.

EFFECTS ON THE ECONOMY IN DISEASE.

The following remarks apply equally to pure strychnia, and its salts, and to the alcoholic extract of *nux vomica*, to which the reader is referred, (see page 446,) and which is preferred by some.‡ It has been administered in

1. *Paralysis*, especially in that arising from the action of lead, in which Bally, Lambert, Bardsley, Andral, Rayer, and Tanquerel,§ have employed it beneficially. In *paraplegia* and *hemiplegia*, it has been prescribed by Lesieur, G. H. Richter, Romberg, Bardsley, Bally, Lafaye, Oesterlen, Reinhardt, Heyfelder, Faye, Mart, Schaible, Raciborski, A. T. Thomson,|| Gellie,¶ Pétrequin,** Toulmouche,†† and numerous others.‡‡

From the results of their observations it would seem, that strychnia is most efficacious in paraplegia; less so in hemiplegia, although it has often been given with advantage in the latter affection; but its administration in hemiplegia requires special circumspection, particularly when the paralysis has succeeded to apoplexy.§§

* Journal de Chimie Méd. v. 494, Paris, 1829.

† Nouveau Système de Chimie Organique. Paris, 1833.

‡ Pétrequin, Bulletin Général de Thérapeutique, Mars, 1840.

§ Gazette Médicale, pour 1835, p. 383.

|| London Med. Gaz. April, 1831.

¶ La Lancette Française, Août 29, 1837.

** Op. citat.

†† Gazette Méd. de Paris, No. 5, 1841, and Encycl. des Sciences Méd. Mars, 1841, p. 438.

‡‡ Pétrequin, Gazette Médicale, Nov. 1838.

§§ See Bally, Considerations sur la Strychnine, &c. in Bulletin Général de Thérapeutique, Fév. 1838.

The results of the recent observations of M. Toulmouche induce him to believe, that strychnia will only succeed in paralysis or other affections "that proceed from some lesion of spinal innervation, occasioned by excessive masturbation or indulgence in venereal pleasures, by the abuse of spirituous or narcotic liquors, by the action of the emanations of lead, &c.;" and that it is never successful in paralysis, which is owing to an inflammatory condition of the brain or spinal marrow. He is of opinion, that strychnia has a directly excitant effect upon the spinal marrow, and secondarily on the organs that receive their nerves from it.

Romberg affirms, that, as a general rule, in cases of paralysis dependent upon disease of the central organs of the nervous system, he has never seen any striking effect from the endermic use of strychnia, and that great care is needed lest it should react injuriously on the brain. He considers it especially adapted for cases of paralysis, that are dependent upon some affection of the spinal marrow induced by mechanical concussion; as well as for the *local paralysis* that succeeds to rheumatism, suppressed exanthems, &c. Dr. Pereira* has seen it very serviceable in that *shaking or trembling action of the muscles*, which is produced by habitual intoxication. G. H. Richter cured a case of *aphonia* by it, and it has been much used, and successfully, in *amblyopia* and *amaurosis*, by Short, Liston,† Guthrie, Middlemore,‡ Henderson, Furnari,§ Mart, Pétrequin,|| and others. Mr. Tyrrell and Mr. Lawrence,¶ however, affirm, that they have found it inefficacious in amaurosis. In these cases, it is generally used endermically on the temporal region. Dr. Stevenson** derived benefit from it — when applied in this way — in cases of amaurosis of many years' duration. Half a grain was repeated twice a day until tremors of the limbs were produced. He employed it in the same manner in other cases of local paralysis. In cases of amaurosis, Henderson advises, in addition, that a solution of strychnia should be dropped into the eye. It has likewise been given successfully in *paralysis of the bladder* by Schaible, Bally, Hennemann, Behrend,†† and others, and in *paralysis of the facial nerve*.‡‡ In two cases of *paralysis*

* Medical Gazette, vol. xix.

† Lond. Med. Gaz. v. 541 and 575.

‡ Midland Med. and Surg. Reporter, May and August, 1831.

§ A. Bouchardat, Annuaire de Thérap. pour 1841, p. 8. Paris, 1841.

|| Bulletin Général de Thérapeutique, Juillet, 1838.

¶ A Treatise on Diseases of the Eye, Amer. edit. by Dr. Hays, p. 519. Philad. 1843.

** Transactions of the Medical and Physical Society of Calcutta, vol. v.

†† Medicin. Zeitung, Sept. 1837, S. 190.

‡‡ Dr. O'Brien, Med. Chirurg. Review, and L'Expérience, Nov. 1838; and Beales, New York Journal of Med. and Surg. July, 1839, p. 201.

of the rectum in elderly people, accompanying a disordered state of the bowels, the Author found the best effects from the endermic use of strychnia—in the quantity of a quarter of a grain, night and morning, to a blistered surface on the sacrum.

In high grades of paraplegia, the internal use of the remedy is to be preferred, but in general the endermic administration is more advisable.

In paralysis of the limbs, a spot is selected in the vicinity of the spinal marrow.

Strychnia is likewise given in other affections. Very favourable reports have been made as to its efficacy in

2. *Neuralgia*. Mart found it beneficial in tic douloureux and in nervous headach; Magnus, in a case of neuralgia of the arm, and several successful cases have been published by Dr. Pidduck.*

3. *Traumatic tetanus*. In this disease, it has been recommended by Lüders.

4. In *Hysteria*, *Hypochondriasis*, and *Dyspepsia*,† it has been advised by Schmidtman and Basedow, but morphia appears to render more essential service.

5. In *Chorea*, Romberg saw good effects from it. It has likewise been advised in *epilepsy*‡ and *cataplexy*. In a successful case related by Dr. Weyland, nitrate of strychnia was taken in such quantity as to produce the peculiar tetanic effects of strychnia. Fricke has administered it successfully in—

6. *Syphilitic Osteocopi*. It has also been given with benefit in cases of

7. *Dysentery* and *Diarrhœa*, by Bardsley, Recamier, Geddings,§ and others; and has been used endermically in *cholera*—two or three grains being applied to a blistered surface on the nape of the neck. By MM. Dreyfus, Grimaud d'Angers and Potton it was given internally in the same affection to allay vomiting:—a quarter to half a grain being added to three ounces of water, and prescribed in the dose of a spoonful every hour. || Dr. Ryan¶ asserts, that he has repeatedly known a few of the pills—the formula for which is given below—check a profuse diarrhœa with rice coloured evacuations, and even when the extremities were blue in malignant cholera.

8. *Amenorrhœa*. Of twelve cases of suppressed menstrua-

* Lond. Med. Gazette, Aug. 7, 1840, p. 759.

† Dr. Melcombe, in Lond. Med. Gaz. for Mar. 4, 1837, p. 850.

‡ Brofferio, in Repertorio Medico-chir. di Torino, 1825, and Revue Médicale, iv. 488, Paris, 1825; and Weyland, Wochenschrift für die gesammte Heilkunde, cited in Encyclograph. des Sciences Méd. Janvier, 1841, p. 65.

§ N. American Archives, No. 2, Nov. 1834.

|| Mérat and De Lens, Dict. de Mat. Méd. Art. Strychnine.

¶ Formulary, 3d edlt. p. 335, Lond. 1839.

tion, treated by Bardsley, ten were cured, and two relieved. Dr. Churchill* had also two cases, in which the cure by it was complete and permanent.

Lastly. From its efficacy in analogous affections of the digestive mucous membrane, Dr. Stokes† thinks there is good reason to hope, that it may prove useful in *bronchitis*. It has been employed, indeed, in all the cases in which the alcoholic extract of *nux vomica* has been found of service, than which it is of course to be more relied upon, in consequence of its greater uniformity; *nux vomica* itself being often found unequal.

MODE OF ADMINISTERING.

Pure strychnia is best exhibited internally, in the form of pill, or in spirituous solution; but if a little acid, especially the acetic, be added to it, it may be given in watery solution, as in this way a salt of strychnia may be formed extemporaneously. The dose is from one-sixteenth to one-eighth of a grain, which may be gradually increased until a grain is taken. In ordinary cases, it will be sufficient to raise the dose to half a grain, two or three times a day; but if any circumstance should arise to cause its discontinuance, it ought not to be recommenced in doses as large as the last, but with small doses, as at the beginning. In the endermic application of the remedy, we sprinkle, twice a day, a quarter of a grain on the denuded surface, and slowly increase the quantity to half a grain or more should this be necessary. If the larger doses do not act more beneficially, it will be advisable to discontinue the remedy for a few days — after which the smaller doses may again exert a signal influence — rather than to carry the dose still higher. M. Pétrequin‡ thinks, that the endermic use of strychnia frequently fails owing to the vesicated surface, to which it is applied, becoming covered with a layer of coagulable lymph, in consequence of which the strychnia is unable to make its appropriate impression. This layer of lymph should be removed as far as possible at each application; and as the vesicated surface daily becomes less and less sensible, the dose must be proportionably increased. M. Pétrequin recommends, that a third or a fourth of a grain of strychnia should be mixed with two or three grains of powdered *nux vomica*, and the compound be sprinkled on the surface; but it would seem to be far preferable to increase the dose of strychnia than

* Outlines of the Principal Diseases of Females, Dunglison's Amer. Med. Library edit., p. 54. Philad. 1839.

† Treatise on Diseases of the Chest, p. 125, Dublin, 1837, and Amer. Med. Library edit., Philad. 1838.

‡ Bulletin de Thérapeutique, Mars, 1840.

to place so much insoluble and irritating powder on the sensitive surface.

Pilulæ strychniæ.

Pills of strychnia.

R. Strychniæ pur. gr. ij.
Confect. rosæ, ℥ss.
Divide in pilulas xxiv.

Dose. — One to two, morning and evening. *Magendie.*

R. Strychniæ, gr. j.
Confect. ros. ℥ss.
Glycyrrhiz. pulv. ℥ss.
Divide in pilulas xij.

Dose. — One, night and morning. The quantity may be increased to four or five daily. *Ryan.*

R. Strychniæ, gr. ij.
Extract. valerian. q. s.
ut fiat pil. xxxij.

Dose. — One, every morning fasting for five days — afterwards one, morning and evening, in *torpid amaurosis*. *Furnari.*

Tinctura strychniæ.

R. Strychniæ pur. gr. iij.
Alcohol, 36° (.837) f. ℥j. M.

Dose. — Six to twenty-four drops, twice or thrice a day. *Magendie.*

Mistura strychniæ.

Mixture of strychnia.

(*Potion stimulante.*)

R. Aq. destillat. f. ℥ij.
Strychniæ, gr. i.
Sacch. ℥ij.
Acid. acet. gtt. ij. M.

Dose. — A dessert-spoonful, morning and evening. *Magendie.*

Collyrium strychniæ

Collyrium of strychnia.

- R. Strychniæ, gr. ij. — iv. — vj. — viij.
 Acid. acet. dil.
 Aq. destillat. ââ. f. ʒj. M.

Two drops to be let fall into the eye, a few times a day, in
amaurosis. *Henderson.*

Linimentum strychniæ.

Liniment of strychnia.

- R. Strychniæ, gr. xxiv.
 Ol. oliv. ʒj. M.

Twelve drops of the oil to be rubbed on the temples four
 times a day in cases of *amaurosis.* *Cunier.*

CXXXIV. STRYCH'NIÆ ACE'TAS.

SYNONYMES. Strychninæ Acetas, Strychnium Aceticum, Acetas Strychnii
 seu Strychnicus, Acetate of Strychnia or Strychnine.
German. Essigsaures Strychnin, Strychninacetat.

In addition to the acetate, formed extemporaneously, as mentioned under strychnia, the proper acetate of strychnia has been administered, especially by Lüders and Fricke. It may be made, like the acetate of quinia, from the direct combination of *strychnia* with *acetic acid*. According to Thénard, it is very soluble, and crystallises with difficulty. Even when diluted 40,000 times, its solution occasions a sense of bitterness on the tongue.

The following formulæ have been given by the physicians cited.

Guttæ acetatis strychniæ.

Drops of acetate of strychnia.

- R. Strychniæ acet. gr. iij.
 Alcohol. f. ʒj.
 Aq. cinnam. f. ʒvij. M.

Dose. — Five drops, twice a day, gradually increasing the
 dose. *Lüders.*

Tinctura acetatis strychninæ.*Tincture of acetate of strychnia.*

R. Strychninæ acet. gr. iss.
 Alcohol. f. 3ss. M.

Dose. — From three or four to twenty or thirty drops, to be taken at bed-time, in cases of *syphilitic pains of the bones*.
Fricke.

CXXXV. STRYCH'NIÆ I'ODAS.

SYNONYMES. Strychninæ Iodas, Strychnina Iodata, Strychnium Iodicum, Iodas Strychnii seu Strychnicus, Iodate of Strychnia or Strychnine.
German. Iodsaures Strychnin, Strychniniodat.

METHOD OF PREPARING.

The preparation of this salt, according to Magendie, is easy. It is sufficient to add a concentrated solution of *iodic acid* to *powdered strychnia*; in a moment, the mass swells up, absorbs water, becomes thicker and at times very consistent. It is now treated with *boiling alcohol*, filtered, and left to spontaneous evaporation. In this way, beautiful crystals of iodate of strychnia are obtained. The iodic acid, proper for this preparation, is obtained, according to Geiger, in the following manner. Nine parts of iodate of baryta are boiled with two parts of oil of vitriol, previously diluted with ten times as much water, for half an hour. It is then filtered, and evaporated by a gentle heat to the consistence of a thin syrup, and is exposed to the air for spontaneous evaporation.

Iodate of strychnia may likewise be formed by double decomposition, by mixing a soluble iodate, as iodate of soda, with a solution of sulphate or muriate of strychnia. The iodate of strychnia is precipitated, which may be treated with boiling alcohol, and crystallised as above directed.

The iodate is of a white colour, and crystallises in beautiful prismatic needles: it is but slightly soluble in cold water, but more so in boiling water and alcohol.

EFFECTS ON THE ECONOMY.

"This salt," says Magendie, "is one of the most active poisons with which I am acquainted. A single grain is sufficient to destroy a strong dog under tetanic symptoms. It acts, likewise, powerfully on the diseased organism. I gave it to several persons with a success which far exceeded my expectations. It proved effectual in some *old paraplegic affections*, which had been esteemed incurable, and after all the usual remedies had been administered in vain."

He gave it in pills, each of which contained one-eighth of a grain. One of these was prescribed night and morning, and the dose was gradually increased, until ultimately a grain was taken in the twenty-four hours. The greatest circumspection was, however, necessary in its use.

Magendie is of opinion, that the *Hydriodate of Strychnia*, *Strychnium Hydroiodicum*, *Hydriodas* seu *Iodhydras Strychnii* seu *Strychnicus*; Germ. *Iodwasserstoffsaures Strychnin*, *Iodwasserstoff Strychnin*, might be advantageously introduced into medicine. It is prepared by mixing a solution of *iodide of potassium* with a concentrated solution of *acetate of strychnia*: a white crystalline powder is precipitated, which is soluble in alcohol, and is pure hydriodate of strychnia.

It does not appear to have been as yet used in medicine.

CXXXVI. STRYCHNIÆ NITRAS.

SYNONYMES. *Strychninæ Nitras*, *Strychnium Nitricum*, *Nitras Strychnii* seu *Strychnicus*, *Nitrate of Strychnia* or *Strychnine*.
German. *Saltpetersaures Strychnin*, *Strychnin Nitrat*.

This preparation of strychnia has been more used in Germany than any other. It has been received into the Prussian Pharmacopœia, (*Landespharmakopöe*,) where it is directed to be prepared in the following manner:

METHOD OF PREPARING.

On eight pounds of *nux vomica*, sixteen pounds of *spirit of wine* (*Kornbranntwein*) are poured, and the liquid is distilled to one-half. The *nux vomica* is then freed from the liquor by filtering, is dried and reduced to coarse powder. This is digested two or three times, with a sufficient quantity of the spirit,

and after digestion it is strained. The tinctures are then subjected to distillation, and what remains is evaporated along with the fluid that remained after the boiling; to this, *acetate of lead*, dissolved in a sufficient quantity of *distilled water*, is added so long as a precipitate falls. The fluid, separated as much as possible from the precipitate, by means of the filter, is now evaporated to one-half, by a gentle heat. When cold, it is mixed with two ounces of *calcined magnesia*, and is suffered to stand for three days, when the deposit is separated by the aid of the filter, and is washed, and dried. This, after having been rubbed to powder, is digested two or three times in *alcohol*, and the tinctures are subjected to distillation, until only a few ounces remain. The strychnia, which on cooling appears in the retort in the form of a white powder, is separated by the filter, washed two or three times with *rectified spirit of wine* diluted with an equal quantity of *common water*, and is neutralised by a proper quantity of *dilute nitric acid*. The filtered fluid is evaporated by a gentle heat so as to allow the formation of crystals. These crystals are needle-shaped, colourless, of a silky splendour, and a very bitter taste; they are soluble with difficulty in alcohol, but dissolve in ether.

METHOD OF ADMINISTERING.

The dose and mode of administering the nitrate of strychnia are the same as in the case of pure strychnia. Its endermic application will sometimes succeed when the internal administration has been more limited in its results. The experiments instituted by Dr. Stannius, and others, and referred to in a former page (552), were with nitrate of strychnia.

Magendie found, in his experiments, that this salt completely prevented the coagulation of the blood.*

CXXXVII. STRYCH'NIÆ SULPHAS.

SYNONYMES. Strychninæ Sulphas, Strychnium Sulphuricum, Sulphas Strychnii seu Strychnicus, Sulphate of Strychnia or Strychnine.

German. Schwefelsaures Strychnin, Strychninsulphat.

The same effects have been observed from this preparation as from the others. It is also dispensed in the same forms and doses. It may be obtained by the simple union of *strychnia* with *sul-*

* Leçons sur le Sang; and translation in Lond. Lancet, Jan. 26, 1839, p. 637.

phuric acid. According to Pelletier, 100 parts of the alkaloid saturate 10.486 of the acid. It is soluble in less than sixteen parts of cold water, and crystallises, when neutral, in transparent cubes; when acid, in needles. Its taste is extraordinarily bitter. It is decomposed by every soluble salifiable base.

CXXXVIII. SULPHURIS CARBURETUM.

SYNONYMES. Sulphuretum Carbonii seu Carbonei, Carbonium seu Carboneum Sulphuratum, Alcohol Sulphuris, Bisulphuretum Carbonii, Sulphuret of Carbon, Bisulphuret of Carbon, Carburet of Sulphur.

French. Sulfure de Carbon, Carbure de Soufre, Soufre Carburé, Alcool de Soufre.

German. Schwefelalcohol, Schwefelkohlenstoff, flüssiger Kohlenschwefel, Kohlensulfurid.

Carburet of sulphur or sulphuret of carbon was discovered by Lampadius in the year 1796. It is a transparent and colourless fluid at the ordinary temperature; has a very penetrating and disagreeable odour; and a taste cooling at first, but afterwards burning, acrid, and somewhat aromatic. Its specific gravity is 1.263. It boils at 134° of Fahrenheit. It is not decomposed at the highest temperatures; but volatilises rapidly in the air, and burns readily. It is not soluble in water, but is so in alcohol, ether, and in the fixed and volatile oils. Water separates it immediately from those solutions. It unites intimately with the alkalies; but, of the acids, the aqua regia — which is a mixture of the nitric and muriatic acids — alone lays hold of it. It dissolves potassa, camphor, sulphur, and phosphorus. Lampadius, in the first instance, regarded sulphuret of carbon as a compound of sulphur and hydrogen; it is now, however, decided, that it consists of sulphur and carbon, — according to Vauquelin, in the proportion of 85 or 86 to 15 or 14; according to Berzelius, and Marcet, of 84.84 to 15.16.

MODE OF PREPARING.

The following method is recommended by Mitscherlich:*

The temperature at which sulphur enters into ebullition is not sufficient to make the two substances combine, but if burning coals be placed in contact with vapours of sulphur, the combina-

* *Elémens de Chimie*, traduits par M. B. Valerius, i. 156. Bruxelles, 1835.

tion takes place immediately. With this view, a tube of porcelain may be used, or, what is better, one of cast iron, lined internally with a coating of clay by running it several times through a paste of clay and water, and heating the tube each time. In this manner, the crust of dry clay will become strong enough to prevent the sulphur from attacking the iron. The tube is then filled with strongly calcined coals, and is heated to redness in an oblong furnace. One end of the tube is closed by a cork, and a small hole is made at the upper part of the tube, through which the sulphur is introduced, and which is closed by a plug. The other end, which has passed through the furnace, is likewise closed by a large cork, traversed by a glass tube. To make the stoppers close the tube hermetically, they are boiled with glue. The long glass tube passes into a large jar, through a hole in which it is adapted hermetically by means of a cork. The ordinary aperture of the jar is closed by a cork in which a tube is fitted hermetically, which passes through the window. At the bottom of the jar is contained a little water. The long tube passing from the furnace to the jar, may be kept cool by water made to drop upon it, or by covering it with snow or ice.

When the charcoal is heated to redness, small fragments of sulphur are dropped in, from time to time, by means of the aperture before mentioned, which must be carefully closed each time afterwards. The sulphur, in melting, runs towards the hottest parts of the tube, to which a slight inclination has been given on placing it in the furnace. It enters into ebullition, and is transformed into sulphureous vapour, which, by passing over the hot coals, combines with them: the sulphuret of carbon, or carburet of sulphur, formed, condenses in the long tube, from which it runs into the jar, and falls to the bottom of the water. As the coal always retains a little hydrogen, the sulphur likewise unites with it, to form a gaseous body, which is carried off by the tube passing through the window.

Carburet of sulphur is preserved in well-stopped bottles, and is covered with about an inch of water, whence it can be best obtained for use by means of a small glass or ivory syringe.

EFFECTS ON THE ECONOMY.

Carburet of sulphur holds a place amongst the transient or diffusible stimulants.* Its most marked effects are said to consist in its "exciting the function of cutaneous transpiration to

* Wutzer, *Journal de Chimie Méd.*; and *Amer. Journ. Med. Sciences*, Nov. 1831, p. 215.

copious sweating ; increasing the secretion of urine, elevating the temperature of the body, quickening the pulse, and causing congestions towards the head and those parts of the body whose vitality may have been already somewhat augmented.”* Its most striking agency is exhibited in the more active exercise of the functions of the skin. According to Mansfeld, it acts likewise as an emmenagogue ; but, in this respect, probably only like similar excitants.

On account of its great volatility, it produces on the skin the feeling of considerable cold.

The discoverer of the carburet of sulphur first recommended it as a remedial agent.† He particularly advised it, both internally and externally, in *rheumatic and gouty affections*. In Freiberg, a mixture of one part of camphor, two of carburet of sulphur, and four of alcohol, is a very common external application in rheumatic pains. Kappe found decided advantage from it in gout and rheumatism, and Mansfeld and Wutzer, resting upon a series of observations, maintain, that in rheumatism unaccompanied by fever, or where the fever is slight, it exceeds every other remedy of the class. Dr. Otto,‡ of Copenhagen, prescribes four drops of a mixture, composed of one part of carburet of sulphur, and four parts of highly rectified spirit of wine, to be taken every two hours : and he directs the affected parts to be rubbed with an embrocation, composed of one part of sulphuret of carbon, and four parts of olive oil. The cure, he states, is ordinarily effected in from eight to fifteen days. In deep-rooted dyscrasies, however, these gentlemen found no advantage from it. On the other hand, in trials at the Berlin Charity, it was found to be of no avail in chronic rheumatism, although it was used for a long time, and given in by no means small doses.

Mansfeld, also, employed it in cases of *after-pains*, rubbed, without admixture, on the abdomen ; and he affirms, that good effects resulted from it, even when ergot had failed.

In *hysteric fainting*, the same gentleman found it very useful when internally exhibited. Lampadius, likewise, recommended it in *fainting*, as well as in *asphyxia*. Krimer found it extremely efficacious in *asphyxia from carbonic acid*, but he frequently thought it necessary to premise bloodletting. In this way, he treated eleven cases, and only one — in which apoplexy had already supervened — terminated fatally. The same

* Riecke, Die neuern Arzneimittel, S. 109 ; and 2te Auflage, S. 166. Stuttgart, 1840.

† Lampadius, in Bulletin des Sciences Médicales de Ferussac, xi. 315.

‡ Annales de Chimie Médicale, and Amer. Journal of the Med. Sciences, for Nov. 1836, p. 222.

physician exhibited it in some cases of *drunkenness*, attended with loss of consciousness, and found its effects very beneficial. He gave it with great advantage once in a case of *goître*; and, in *incarcerated hernia*, no agent, he says, facilitates so much the taxis as the cold produced by dropping carburet of sulphur on the tumour.* Lampadius found, that *slight burns* were instantaneously cured by it. Clarus recommends it in *hypertrophy of the coats of the stomach*, and in *contraction of the œsophagus* — administered according to the formula given below. Every thing, indeed, says Riecke, encourages its further trial as a remedial agent.†

MODE OF ADMINISTERING.

Internally, carburet of sulphur may be given in doses of from one drop to four, every five or ten minutes, in cases of *fainting* and *asphyxia*; but where such a rapid analeptic agency is not demanded, it may be given every two or three hours. It may be administered dropped on sugar or in a spoonful of sugared water or barley water. Clarus thinks it is best given in cow's milk.

Externally, it is either applied pure, when a rapid development of cold is needed — as in cases of *burns* and *incarcerated hernia* — or dissolved in alcohol or oil.

Guttæ sulphuris carbureti.

Drops of carburet of sulphur.

R. Sulphur. carbur. f℥ij.
Æther. sulphur. f℥j. M.

Dose. — A few drops on sugar.

Lampadius.

R. Sulphur. carbur. f℥j.
Alcohol. f℥ss. M.

Dose. — Four to six drops, every two hours, in *rheumatism*.

Wutzer.

R. Sulphur. carbur. f℥j.
Alcohol. f℥ij. M.

Dose. — Five, ten, or fifteen drops, three times a day, in cases of *rheumatism*.

Wutzer.

* Journ. de Pharmacie, and Amer. Journal of Pharmacy, ix. 264.

† Die neuern Arzneimittel, u. s. w. S. 110.

Mistura sulphuris carbureti.*Mixture of carburet of sulphur.*

R. Sulphur. carbur. ℥j.
 Lact. vaccin. f. ℥vj.
 Sacch. ℥ij. M.

Dose. — A table-spoonful, four times a day, or oftener.

*Clarus.***Embrocatio sulphuris carbureti.***Embrocation of carburet of sulphur.*

R. Sulphur. carbur. ℥ss.
 Olei amygd. dule. ℥j. M.

To be rubbed in, in cases of *old gouty nodes*.

*Mansfeld, and Otto.**

R. Sulphur. carbur. f. ℥ij.
 Ol. oliv. seu
 Linim. ammon. camphor. f. ℥ij. M.

To be rubbed in, in cases of *rheumatism*.

Wutzer.

R. Camphor. ℥ij.

Solve in

Sulphur. carbur. f. ℥ss.

Adde

Alcohol. f. ℥j. M.

To be used in friction, in cases of *rheumatism*, and especially in *rheumatic odontalgia*.

Lampadius.

* Bibliothek for Læger, 1835, and Brit. and For. Med. Review, July, 1836, p. 252.

CXXXIX. SULPHURIS IODIDUM.

SYNONYMES. Sulphuris Ioduretum, Sulphur Iodatum, Ioduret, or Iodide of Sulphur.

French. Soufre Ioduré, Iodure de Soufre.

German. Iodschwefel, Iodinschwefel, Schwefeliodyre.

MODE OF PREPARING.

Iodide of sulphur is prepared by heating slightly a mixture of four parts of *iodine*, and one of sublimed *sulphur*. The excess of iodine is driven off, and the iodide of sulphur remains as a grayish-black mass, very deliquescent, and readily decomposed by water.

M. G. Van Melekebeke,* has recently proposed the following form :—Take of *Iodine*, two parts; *Washed sulphur*, one part. Bruise them together, and introduce the mixture into a glass tube, pressing it down until the tube is well filled; then seal hermetically. Heat at first gently, until the mixture begins to become of a darker colour; then augment the heat so as to fuse the iodide; keep it for some time in this state, and turn the tube constantly, that the action may be uniform; remove it from the fire, and shake it until the iodide begins to congeal, and until vapours of iodine no longer form; open the tube, and compress again the iodide, in order to have it in fine cylinders. M. Van Melekebeke recommends this as a very expeditious process, and one which enables the pharmacien to prepare the iodide in very small quantity. The committee of the *Société des Sciences Médicales et Naturelles de Malines* approve of the process, but suggest, that the proportion of iodine to sulphur should be three to one.

The following form for its preparation has been introduced into the last edition of the Pharmacopœia of the United States :—Take of *Iodine*, ℥iv. ; *Sulphur*, ℥j. Rub the iodine and sulphur together in a glass, porcelain, or marble mortar, until they are thoroughly mixed. Put the mixture into a matrass; close the orifice loosely, and apply a gentle heat so as to darken the mass without melting it. When the colour has become uniformly dark throughout, increase the heat so as to melt the iodide; then incline the matrass in different directions, in order to return into the mass any portion of iodine which may have condensed on the inner surface of the vessel: lastly, allow the matrass to cool, break it, and put the iodide into bottles, which are to be well stopped.

* Archives de la Médecine Belge, Mars, 1842, p. 307.

EFFECTS ON THE ECONOMY.

Bielt has used this agent in *squamous*, *pustular*, and *papular diseases of the skin*. It has been found especially effective in *psoriasis*, in the form of friction. Patients, who had been long affected with diseases of this kind, which had resisted every other remedy, were cured in four or five months by iodide of sulphur alone. To prevent relapses, Bielt advises that the frictions should be continued after the eruptions have scaled off. He found it equally efficacious in the *lepra vulgaris* of Willan; and in *acne* — the *gutta rosacea* of Alibert — when the inflammation of the skin had passed away. Even *acne indurata* was often completely cured by it.* He found it also beneficial in *inveterate porrigo of the scalp*.† At times, after the rubbing, a diffuse red inflammation of the skin arises, with subsequent desquamation; and, in particular cases, the inflammation extends even to the subjacent cellular membrane. In *old standing lepra*, Rayer‡ prefers it for external use to calomel and white precipitate; and he ranks it highly, with the iodides of mercury, for the cure of *lupus non exedens*; and by Dr. Volmar§ it has been used, with great success, in *herpes pustulosus labialis*.

Iodide of sulphur is likewise extolled by Lugol as a very active therapeutical agent. Cless affirms, that in *chronic squamous affections of the skin*, especially in *psoriasis*, he has employed it with advantage, but he was not able to cure *lepra vulgaris* with it.

It has been strongly recommended in *Tinea capitis*, in the proportion of ten grains of the *iodide* to an ounce of *lard*. A writer, in an English periodical|| affirms, that he was induced to make trial of it in some obstinate cases, and was much astonished at the remarkable power it possessed over the disease. He rubbed it on the head, night and morning, and increased the strength of the ointment according as the affected part was able to bear the stimulus, until the iodide bore the proportion of half a dram to the ounce of lard or spermaceti cerate.

* See, also, Rayer, *Traité Théorique et Pratique des Maladies de la Peau*; and Copland, *Dictionary of Practical Medicine*, Art. *Acne*.

† Cazenave et Schedel, *Maladies de la Peau*, p. 219; and Cogswell on Iodine, p. 120. Edinb. 1837.

‡ *Diseases of the Skin*, p. 634.

§ *Die neuesten Entdeckung. in d. Mat. Med.*; cited by Pereira, *Elements of Materia Medica*, ii. 477, 2d edit. Lond. 1842; or Amer. edit. by Dr. Carson, Philad. 1843.

|| *Lond. Med. Gazette*, for Sept. 9, 1837, p. 879. See, also, M. Cazenave, cited in *Amer. Journ. Med. Sciences*, Oct. 1841, p. 460, and Dr. W. Davidson, *Lond. and Edinb. Monthly Journ. of Med. Sciences*, Dec. 1841.

The inhalation of the vapour of this substance has been employed in *humoral asthma*, by Dr. Copland,* with temporary benefit, and fumigations of iodine and sulphur have been used advantageously in certain *atonic ulcers*, and *chronic cutaneous diseases*.† With this view, the sulphur and iodine may be combined extemporaneously, — say four parts of iodine to one part of sulphur.

MODE OF ADMINISTERING.

Unguentum sulphuris iodidi.

Ointment of iodide of sulphur.

R. Sulphur. ioidid. ℥j.—℥ss.

Adipis, ℥j. M. et fiat unguentum.

Biett. — Rayer.

CXL. URE'A.

SYNONYMES. Ureum, Uricum, Nephrine, Nephrein.

French. Urée, Extrait Savonneux de l'Urine.

German. Harnstoff.

This immediate principle of the urine of man and quadrupeds was discovered in an impure state by Rouelle, in 1773; and since then it has been studied by Cruickshanks, Fourcroy and Vauquelin, Berzelius, Proust, and Liebig more especially.‡

METHOD OF PREPARING.

Urea is obtained by placing a mixture of equal volumes of *urine*, reduced to the consistence of syrup, and *nitric acid* at 20° in a refrigerative bath; by which means crystallised nitrate of urea is precipitated. On decomposing this — washed in the cold and dissolved in water — by *carbonate of potassa*, reducing it almost to dryness, and treating the residue by *alcohol* at 40°,

* Dict. of Practical Medicine, Art. Asthma.

† London Lancet, vol. 1, 1838, and Encyclographie des Sciences Médicales, Août, 1838.

‡ Annales de Chimie et de Physique, x. 369, and Mérat and De Lens, Art. Urée.

which takes up the urea, crystals may be obtained by evaporation, which may subsequently be procured colourless by the agency of *animal charcoal*.

M. Henry,* who was not satisfied with the scanty product yielded by this process, recommends the following:—Add to fresh *urine* a slight excess of *subacetate of lead*; a precipitate is thus formed, which consists of oxide of lead united to the various acids of the urine, together with the mucus, and a great part of the animal matter; the decanted liquid is then treated with *sulphuric acid* in slight excess to separate the lead, and afterwards, in the progress of the evaporation, to decompose the acids of soda and lime, that may have been formed. After having separated the white precipitate, concentrate rapidly over a steady fire, adding a portion of *animal charcoal* during the ebullition. When the whole has become a clear syrup, pass it through linen of close texture, and then reduce it one-third by evaporation. On cooling, the liquid is converted into a yellow mass, crystallised in needles, formed of a great proportion of urea and some salts. The crystals, being drained and pressed, are added to those obtained from the mother waters treated in a similar manner. They are next treated with a very small quantity of *carbonate of soda*, with the view of separating any remaining acetate of lime, and then digested in alcohol of 38° to 40°. The alcoholic solution being filtered, and the alcohol separated by distillation, the urea remains, which may be crystallised afresh from water, if necessary.†

Urea, thus obtained, is in silky or prismatic needles, very soluble, and of a cooling taste.

The following improved method of preparation has been proposed by Prof. Liebig.‡ Twenty-eight parts of *ferrocyanuret of potassium* perfectly dried are mixed with fourteen parts of *peroxide of manganese*, both being reduced to as fine a powder as possible; the mixture is then heated on an iron plate, not in a crucible, over a coal fire to a feeble red heat. At this temperature it inflames, and is gradually extinguished. By shaking it several times at intervals, it is prevented from becoming agglutinated, and the access of air is facilitated. The mass on cooling is treated with cold water, and the liquor is mixed with twenty parts and a half of dry *sulphate of ammonia* of commerce, prepared by saturating sulphuric acid with carbonate of ammonia, and evaporating it to dryness. It is well to put to one side the

* Journal de Pharmacie, xi. 161, Paris, 1829.

† Manual of Materia Medica and Pharmacy; by MM. H. M. Edwards and P. Vavaseur, p. 231. Philad. 1829.

‡ Annalen der Chemie und Pharmacie B. xxxviii.; and Journal de Pharmacie, Août, 1841, p. 502.

first concentrated washings afforded by the ferrocyanuret of potassium; and to dissolve in the last washings, in the cold, the sulphate of ammonia, and to mix them with the first. Commonly, an abundant precipitate of sulphate of potassa forms immediately. The supernatant liquid is poured off, and evaporated in a salt water bath, or rather in a warm place, — care being taken to prevent ebullition. Fresh crystalline plates of sulphate of potassa are deposited, and the liquor is decanted as far as possible. The decanted liquor is then evaporated to dryness, and the residuum is treated with *boiling alcohol* of eighty to ninety *per cent.* This dissolves the urea, which crystallises by the cooling and evaporation of the alcohol, whilst the sulphates do not dissolve.

EFFECTS ON THE ECONOMY.

The experiments of M. Ségalas have established, that urea is devoid of any noxious action on animals into whose veins it has been injected, and, consequently, that we cannot ascribe the serious symptoms to it, which arise from the absorption of urine in certain morbid cases. They demonstrate farther, what has been confirmed by the trials of Fouquier, that urea is a diuretic, and, therefore, might be useful in *dropsy*: the latter gentleman employed it, also, but unsuccessfully, in *diabetes*.* Laennec used it with advantage in a case of dropsy. According to Prof. Fée,† urea is received into the lists of the *materia medica* in the Batavian Pharmacopœia, and in some others less known. It has also been admitted into the French Pharmacopœia.

MODE OF ADMINISTERING.

Urea has been given in solution in distilled water, sweetened, in the dose of twenty-four to thirty grains, and even as high as several drams, in the day.

* Journal de Physiol. de Magendie, ii. 344, and Formulaire pour la Préparation, &c., de plusieurs nouveaux Médicaments.

† Cours d'Hist. Naturelle Pharm. ii. 764: cited in Mérat and De Lens, Dict. de Mat. Méd. Art. Urée.

CXLI. VERA'TRIA.

SYNONYMES. Veratrina, Veratrinum, Veratrium, Veratrine.

French. V  ratrine.

German. Veratrine, Niesswurzstoff.

This alkaloid, which was discovered in 1819, by MM. Pelletier and Caventou,* and almost at the same time by Meissner,† is commonly prepared from the seeds of *veratrum sabadilla* — *Sabadilla* or *Cevadilla*, of the Pharmacopœia of the United States. It is contained in several of the plants belonging to the family Colchicac  .

METHOD OF PREPARING.

Cevadilla is repeatedly treated with *boiling alcohol*. The tinctures, filtered, when almost boiling, allow whitish flakes of wax to be deposited on cooling; the dissolved matters, brought to the consistence of an extract, are now dissolved in *cold water*, and filtered, whereby a small quantity of fatty matter remains on the filter. The solution is then slowly evaporated, when a yellowish orange-coloured precipitate is formed, which possesses the characters of the colouring matter found in almost all woody vegetables. On adding a solution of *acetate of lead* to the still deeply coloured liquid, a new and very abundant yellow precipitate is thrown down, which can be separated by means of the filter. The liquor, now nearly colourless, contains, besides other substances, acetate of lead, which had been added in excess; this is separated by means of a stream of *sulphuretted hydrogen*: the liquor is then filtered, and concentrated by evaporation; treated by *magnesia*, and again filtered. The magnesian precipitate is digested in *boiling alcohol*, and on evaporating the alcoholic liquors, a pulverulent, extremely acrid matter is obtained, which possesses all the properties of the alkalis. It appears at first yellowish; but, by solutions in *alcohol*, and subsequent precipitations, caused by pouring *water* into the alcoholic solutions, it is obtained in the form of a very white and perfectly inodorous powder.‡

Veratria has been received into the London and United States§

* Annales de Chimie et de Physique, xiv. 69.

† Gilbert's Annalen der Physik, lxv. 335.

‡ Magendie's Formulaire pour la Pr  paration, &c., de plusieurs nouveaux M  dicamens.

§ Pharm. of the United States, p. 237, Phila. 1842.

Pharmacopœias.* In these it is directed to be prepared as follows:—Take of *Cevadilla*, bruised, two pounds; *Alcohol*, three gallons; *Diluted sulphuric acid*, *Solution of ammonia*, *Purified animal charcoal*, *Magnesia*, each a sufficient quantity. Boil the cevadilla in a gallon of the alcohol, in a retort with a receiver attached, for an hour, and pour off the liquor. To the residue add another gallon of the alcohol, together with the portion recently distilled, again boil for an hour, and pour off the liquor. Repeat the boiling a third time with the remaining alcohol, and with that distilled in the previous operation. Press the cevadilla, mix and strain the liquors, and by means of a water bath distil off the alcohol. Boil the residue three or four times in water acidulated with sulphuric acid, mix and strain the liquors, and evaporate to the consistence of syrup. Add *Magnesia* in slight excess, shake the mixture frequently, then express, and wash what remains. Repeat the expression and washing two or three times, and, having dried the residue, digest it with a gentle heat several times in alcohol, and strain after each digestion. Distil off the alcohol from the mixed liquors, boil the residue for fifteen minutes in water with a little sulphuric acid and purified animal charcoal, and strain. Having thoroughly washed what remains, mix the washings with the strained liquor, evaporate with a moderate heat to the consistence of syrup, and then drop in as much solution of ammonia as may be necessary to precipitate the veratria. Lastly, separate and dry the precipitate.

The following is the rationale of this process. The cevadilla gives up its veratria united with a vegetable acid to the alcohol; and when the alcoholic extract is treated with water and sulphuric acid, an impure solution of sulphate of veratria is obtained. The magnesia decomposes this, setting free the veratria, which is taken up by alcohol. The alcohol is then distilled off, and the extract is boiled in water with sulphuric acid and animal charcoal: the acid unites with the veratria, whilst the charcoal abstracts the colouring matter. Ammonia, added to the strained solution, unites with the sulphuric acid, and the veratria is precipitated.†

Veratria — *commercial or medicinal veratria* — as prepared by the last process, is pulverulent, of a grayish-white colour, inodorous, and of a bitter acrid taste, causing a sensation of tingling with numbness in the tongue. Veratria is scarcely at all soluble in cold water; but boiling water dissolves one-thousandth part

* For M. Righini's method of obtaining what M. Soubeiran calls "medicinal veratrine," see *Journal de Pharmacie*, Oct. 1837.

† Pereira, *Elements of Mat. Med. and Therap.* 2d edit. ii. 961; or *Amer. edit.* by Dr. Carson, Philad. 1843.

of its weight, and becomes sensibly acrid. It is very soluble in ether, and still more so in alcohol. It is not soluble in alkalies, but is so in all the vegetable acids: with these it forms uncrystallisable salts, which, on evaporation, present the appearance of gum. The sulphate alone affords rudiments of crystals, when its acid is in excess. Nitric acid combines with it; but, if added in excess, it does not colour it red, as in the case of morphia, brucia, and impure strychnia, but very rapidly resolves the vegetable substance into its elements, and gives rise to a yellow detonating matter.

Veratria has an alkaline reaction, When exposed to heat, it liquefies at a temperature of 122° Fahrenheit, and has then a waxy appearance. On cooling, it forms a translucent mass, having the appearance of amber. When distilled on the naked fire, it swells up, is decomposed, and forms water, much oil, and leaves behind a bulky coal.

According to Conerbe,* when prepared in the modes above mentioned, it still contains several other substances, *sabadillina*, *veratrin*, gum resin of *sabadilla*, and a black, greasy substance, which unites the other matters, and conceals their properties.

These may be separated from each other by the successive action of water, ether and alcohol, as in the following table:

Commercial <i>veratria</i>	yieldsto boiling water	1. <i>Sabadillina</i> , which crystallises on cooling.
	insoluble in boiling water	2. <i>Resin of veratria</i> , left in the cold solution. 3. <i>Veratria</i> , soluble in ether. 4. <i>Gum resin of veratria</i> , insoluble in ether, but soluble in alcohol.

On account of its very high price, and the want of well defined external characters, the *veratria* of the shops is said to be very subject to adulteration; and there would not seem to be any good criterion for ascertaining its degree of purity.†

Simon, an apothecary of Berlin, has affirmed, that he has found two alkaloids in *veratrum album*; one of which possesses the property of being precipitated from its solution in acetic or phosphoric acid by sulphuric acid and its salts, like baryta; hence he has given it the name *barytin*.‡

* Annales de Chimie et de Physique, ii. 308.

† Christison, Dispensatory, p. 806, Edinb. 1842.

‡ Pharmaceut. Centralblatt. 1837, p. 191, and Medicinische Annalen B. iv. H. i. S. 9. Heidelb. 1838.

EFFECTS ON THE ANIMAL ECONOMY.

Regarding the effects of veratria on animals, Magendie* has the following remarks :— A very small quantity of acetate of veratria, placed in the nostrils of a dog, instantly excited violent sneezing, which continued for a long time. One or two grains, placed in the mouth, immediately occasioned profuse ptyalism. When a small quantity was introduced into any part of the intestinal canal, and the body was opened to notice its effects, the intestine was observed to be much indurated, and to relax and contract alternately for a certain length of time. The part of the mucous membrane, with which the veratria is made to come in contact, is inflamed ; the irritation spreads, and vomiting and purging are excited. In much stronger doses, the circulation is accelerated, as well as the respiration, and tetanus supervenes, soon followed by death. The effects are still more rapid, if one or two grains be thrown into the cavity of the pleura, or tunica vaginalis. In less than ten minutes, death occurs, preceded by tetanic convulsions. The same quantity, thrown into the jugular vein, induced tetanus and death in a few seconds. Dissection showed, that, even in this case, the veratria had acted on the intestinal canal, the mucous membrane of which was found injected. The lungs, also, exhibited traces of inflammation and engorgement.

Veratria, in large doses, would, doubtless, exhibit the same effects on the human organism. The taste is very acrid, but without bitterness : it excites a copious flow of saliva, even when a small quantity only has been introduced into the mouth. Although it has no smell, it must not be brought too close to the nose, when in the state of powder, as it occasions, even in very minute quantity, violent sneezing, which may prove dangerous. A quarter of a grain immediately induces copious evacuations, and, in a somewhat larger dose, more or less violent vomiting.

According to Turnbull, who has immoderately extolled this remedy, its effect is very different, according as it is exhibited internally, or externally. Externally, it may be applied for weeks and months, without the supervention of any of the effects that succeed its internal administration. Exhibited in this way, it diminishes internal nervous excitement, assuages pain, but does not act on the intestinal canal. In dropsical cases, it is stated to be one of the greatest promoters of the urinary secretion that we possess. The part of the skin on which it is rubbed, either

* Journal de Physiologie Expériment. i. 56 ; and Formulaire pour la Préparation, &c., de plusieurs Médicamens.

in solution or ointment, even when the friction has been continued for a long time, exhibits no evidence of irritation : when, however, the dose of veratria has attained a certain extent, the patients feel a considerable degree of heat, and a kind of pricking sensation in the rubbed part, whence it may be concluded, that the veratria is active, pure and genuine : under a more prolonged use of the remedy, this feeling of warmth and pricking extends over the surface of the whole body ; and, in some cases, involuntary twitchings have been observed in the muscles of the mouth and eyelids. These symptoms, however, pass off, when the frictions are discontinued for a day or two. Only in a few cases, according to Turnbull, was any eruption induced by its application. The endermic use of the remedy always, however, excited so much irritation as to prevent its repetition.

Thus much for Turnbull : — His views and experience have by no means been confirmed by the generality of observers. The external application of veratria cannot always be used without local irritation ensuing. An English physician, labouring under rheumatism of the arm, rubbed upon it an ointment composed of twenty grains of veratria to an ounce of lard ; and, immediately afterwards, so much pain was induced in the part, that he was obliged to take opium to obtain rest ; an eczematous eruption subsequently appeared on the arm, but the rheumatism remained uncured. Ebers applied it endermically, but witnessed nothing more than a violent burning in the part, such as is commonly the case with other agents. He frequently observed the pricking sensation mentioned by Turnbull, and it was often to such an extent as to be almost insupportable. According to the trials of Ebers, its diuretic effect was not restricted to dropsy, but was usually evinced in other diseases. The sensorium appears never to have been implicated, but when applied in small doses over the pit of the stomach it produced striking effects on the spinal marrow, and the nerves connected therewith, — as the nerves of the thorax and abdomen : violent pain was experienced, which spread through the whole extent of the nerves distributed to the parietes of the abdomen, with a sense of traction along the spinal marrow, twitchings, great anxiety, orthopnoea, nausea and vomiting, and a feeling, which the patient was unable to describe, except that it was almost intolerable.

When given internally, veratria speedily caused nausea, retching, vertigo, and complete loss of appetite ; so that Ebers soon abandoned its internal use, and, like Turnbull, gave the preference to the external.

Owing to its presumed effects on the nervous system, and especially on the spinal marrow, and the nerves connected with it, its use was suggested in *nervous diseases* — particularly in *neuralgia*, *prosopalgia*, and *ischias* — in which it is said to have

been found most efficacious by Turnbull, Ebers,* Brück, Suffert,† Professor S. Jackson,‡ Cunier,§ and others. In no class of diseases, according to the first of these writers, have the beneficial effects of the ointment of veratria exhibited themselves more strikingly, and by no other remedy has the same amount of relief been induced in so short a time. Even in *tic douloureux*, a single friction is said to have been sufficient to remove the disease without relapse. Two circumstances chiefly have here to be borne in mind, — *first*, the extent of the pain, for when it is not concentrated on a point, but spreads along the branches of the nerves, the cure is easier, and a weaker ointment is needed; and, *secondly*, the duration of the affection. In long protracted cases, a complete cure is far more difficult, and can, in general, be effected only after a long period. The paroxysms, however, may be relieved by an ointment composed of from twenty to forty grains to an ounce of lard. In this case, it must be strongly rubbed in, so as to excite itching of the skin: care must be taken, however, that the ointment does not touch the conjunctiva, as the smallest quantity of veratria would induce violent inflammation. Ebers, likewise, found advantage from its use in *chorea*, *hypochondriasis*, and *hysteria*; and Turnbull in *paralysis*. Both extol it in *rheumatism* and *gout*, in relation to which Ebers remarks, that the remedy has appeared to him more efficacious when the nervous system, or some nervous branches, were predominantly affected, and when the gastric affection was entirely removed. In the cases treated by veratria, relief was sooner obtained, and the cure was more speedy and complete, than when other agents were employed; the secretion of urine was augmented; restlessness disappeared; and sleep returned, without any evidences of narcosis. As regards *acute rheumatism*, Turnbull remarks, that veratria is not to be preferred to antiphlogistics; in these cases, a weaker ointment must be used (ten grains to the ounce): in chronic cases, the quantity may be carried much higher; and — especially when extensive organic changes have supervened in the parts — it must be continued for a great length of time. In *lumbago*, *ischias*, and *rheumatism of the chest*, not more than one or two rubbings were generally necessary. In *gout*, according to Turnbull, it may be exhibited both internally and externally; in the

* Casper's Wochenschrift, 1837, No. 47.

† Berlin, Medicin. Centralzeitung, 1837, p. 670, and Heidelberg. Medicin. Annal. B. iv. H. 1, S. 11.

‡ Amer. Journ. of Pharmacy, vol. iii. new series, p. 186. Philad. 1838.

§ Bulletin Médical Belge, Dec. 1837, and Bullet. Général de Therap. Dec. 1838. See, also, Foreke, Physiologisch-therapeutische Untersuchungen über das Veratria, Hannov. 1837; cited in Bib. Générale, Encyclog. des Sciences Médicales, Août, 1838.

former mode of administration, he compared its efficacy with that of colchicum: the latter method has been recommended, also, by Sir C. Scudamore. It was, likewise, found very advantageous by Bardsley* in *chronic rheumatism*.

Dr. Bushnan has strongly recommended the ointment of veratria in *dysmenorrhœa*, which he supposes may be frequently owing to perversion of the nervous action of the lower portion of the spinal nerves; and in certain spasmodic affections of the larynx, presumed by Dr. Tunstall† to be connected with a morbid condition of the superior portion of the spinal marrow, it is asserted to have been efficacious.

It has also been used in *amaurosis*, the ointment being rubbed on the temples and forehead for a few minutes, once or twice in twenty-four hours. The friction should be continued until it causes redness, heat, and stinging. Messrs. Lawrence‡ and Tyrrel affirm, however, that it is wholly inefficacious.

Veratria would seem to have been most efficacious in cases of *dropsy*. "Unadulterated veratria," says Ebers, "acts often on the urinary secretion with magical powers, and it may seem fabulous, when I remark, that friction with a very weak ointment of veratria two or three times in the twenty-four hours on the inner part of the thigh, or the back, epigastric region, or around the navel, has excited such a copious secretion of urine, that the patients, under its long continuance, began to feel weak; and the anasarca, and even the dropsical accumulation, in the abdomen, in a short time almost disappeared — circumstances which indicate the caution that ought to be observed in apportioning the dose, when we are satisfied of the goodness of the article." He properly remarks, however, that veratria, by augmenting the secretion of urine, may not remove the dropsy, but, by occasioning the absorption of the effused fluid, it allows the physician to examine as to the existence of organic mischief. Ebers gave it in many of the lighter hydroptic cases, which follow intermittents and other forms of fever, and often with great and rapid success; likewise, in twenty-four more serious cases, fifteen of which recovered, and one experienced relief: eight very complicated cases terminated fatally, and in four of these diuresis occurred; in four not.

Fricker§ likewise obtained very good effects from the use of

* Hospital Facts and Observations, Illustrative of the Efficacy of Strychnia, Brucia, Veratria, Iodine, &c. Lond. 1830.

† Provincial Med. and Surg. Journ. Aug. 14, 1841.

‡ A Treatise on the Diseases of the Eye, Amer. edit. by Dr. Hays, p. 519, Philad. 1843.

§ Würtemb. Medic. Correspondenzblatt, B. vi. S. 157 and 341; and Heidelb. Medicin. Annal. B. iv. H. i. S. 15.

an ointment of veratria in dropsy : but, on the other hand, Späth found it of no avail.

Turnbull observed, from the internal use of veratria, as well as from its application to the pit of the stomach, a diminution in the frequency and force of the pulsations of the heart ; and, in cases where these were more excited than natural, restoration of a regular circulation. He exhibited it, consequently, in *heart diseases*, especially in those of gouty and rheumatic diatheses, in simple *nervous and gouty palpitation*, and as a diuretic in *organic heart diseases*, in which it frequently seemed to afford relief.

The observation of Turnbull — that by the external application of veratria, in chronic rheumatism with swellings of the joints, these disappeared — induced him to try it in *glandular swellings* ; he found, that in *goutte*, in *swellings of the mammary glands* unaccompanied with pain, in *buboes*, and in *scrophulous tumours* of various parts, even in cases in which iodine had failed, it rendered essential service. It has, according to him, the advantage, that the skin is not subsequently irritated by it, and when, after the rubbing, the superfluous ointment is washed off with soap and water, the affected parts can soon afterwards be exposed to the air. Of an ointment formed of ten grains of veratria to half an ounce of lard, a piece, about the size of a nut, is rubbed in for ten minutes twice a day, and every week the strength of the ointment is increased.

Magendie* recommends, that veratria should be given, also, as a drastic cathartic, especially where a speedy action on the bowels is needed. Prescribed with this view, it has been found effective in several aged persons, in whom a collection of excrement had formed in the large intestine. Turnbull advises it in the opposite condition of the bowels — in *diarrhœa* — given in the dose of half a grain — a disease in which, it is well known, our ordinary cathartics often prove extremely serviceable.

It would appear that veratria is an article which is frequently adulterated. Such, at least, is the opinion of many practitioners, and in this way they account for the discordance amongst observers as to its virtues.† The veratria with which Ebers made his first trials, was obtained from the French laboratories ; it exhibited the whole power of this heroic agent : on employing, however, a new preparation, he found it entirely useless ; and afterwards, with another, he derived all the benefit obtained from the first.

The observations of Ebers would induce us to give farther trials to it, but the Author must confess, that his experience, thus

* Formulaire pour la Préparation, &c. de plusieurs nouveaux Médicamens.

† Ebers, and Riecke, Die neuern Arzneimittel, u. s. w. S. 407, and 2te Auflage, S. 641. Stuttgart, 1840.

far, has by no means confirmed the eulogiums of Turnbull ; and this is the general sentiment, he thinks, of the profession.* It has often been used externally by him as well as by many other American physicians, but it has almost always fallen short of the mark.†

MODE OF ADMINISTERING.

Veratria may be given either in pills or in spirituous solution ; the dose being from one-twelfth to one-sixth of a grain several times a day. Externally, it is best administered in the form of ointment. In the latter case, Ebers generally strews two grains on the denuded skin.

Mistura veratriæ.

Mixture of veratria.

R. Veratriæ, gr. j.
Aq. destillat. f. ʒij. M.

A dessert-spoonful to be taken in one or two ounces of sugared water, in cases of *tic douloureux*. *Magendie.*

Pilulæ veratriæ.

Pills of veratria.

R. Veratriæ, gr. ss.
Acaciæ, ʒj.
Syrup. acac. q. s. ut fiant pilulæ vj.

Dose. — One pill, to be repeated two or three times a day, according to circumstances. *Magendie.*

R. Veratriæ, gr. j.
Glycyrr. pulv. gr. xii.
Ext. hyoscyam. gr. vj.
M. fiant pilulæ xij.

Dose. — One, three times a day. *Turnbull.*

* Gully's Translation of Magendie's Formulary ; and Joy, in Tweedie's Library of Medicine, v. 289. Lond. 1840 ; or 2d Amer. edit. Philad. 1842.

† See, on the Preparation, Employment, Action and Medicinal Virtues of Veratrine, Ebers, in Hufeland's Journal, B. lxxxvi. 1838.

*Tinctura veratriæ.**Tincture of veratria.*

R. Veratria gr. iv.*
Alcohol. f.℥j. M.

Dose. — Ten, fifteen, twenty, to twenty-five drops in a glass of water. — Given in *dropsy*. *Magendie.*

Magendie recommends that the tincture should also be used externally, in cases of dropsy or gout.

*Linimentum veratriæ.**Liniment of veratria.*

R. Veratriæ, gr. viij.
Solve in
Alcohol.
Tinct. sapon. camphorat. āā. f.℥ss..

*Unguentum veratriæ.**Ointment of veratria.*

R. Veratriæ, gr. v. x. vel xx.
Adipis, ℥j.
Misce intimè.

For external use. The size of a hazel-nut to be carefully rubbed in, morning and evening, or oftener, for from five to fifteen minutes. *Turnbull.*

R. Veratriæ, ℥j.
Tere cum.
Ol olivæ, ℥j.
Et adde
Unguent. cetacei, ℥vij. Misce.

SULPHATE OF VERATRIA — *Veratriæ Sulphas* — possesses the same virtues as veratria. Magendie gives the following form for internal administration : —

* In the *Pharmacopée Universelle*, of Jourdan, (ii. 643,) there is the serious error of directing ℥iv. in the preparation of this tincture, in place of four grains!

Solutio veratriæ sulphatis.*Solution of sulphate of veratria.*

R. Veratriæ sulphat. gr. j.
Aquæ destillat. f. ʒij. Misce.

Dose. — ʒj. to ʒiv. in a mixture. The preparation has been suggested as a substitute for the *Eau medicinale d'Husson*.

CXLII. ZINCI CHLO'RIDUM.

SYNONYMES. Zinci Chloruretum, Zincum Chloratum, Z. Muriaticum (Oxydatum), Z. Salitum, Chloruretum Zincicum seu Zinci, Chloretum Zinci seu Zincicum, Butyrum Zinci, Murias Zinci seu Zincicus, Chloride, or Chloruret, Hydrochlorate, Muriate, or Butter of Zinc.

German. Zinkchlorid, Salzsaures Zinkoxyd, Chlorzink, Zinkchlorüre, Zinkbutter.

MODE OF PREPARING.

The chloride of zinc results, — when to any given quantity of pure *muriatic acid*, *pure oxide of zinc* is added, by the aid of gentle heat, until no more is dissolved: the solution is then filtered, and evaporated in a porcelain dish to dryness; whereby a jelly-like — and, by high drying, a firm, white, and by careless drying a light brownish — substance remains, of an austere, sourish, metallic taste, which must be rubbed to powder, and preserved in a closely-stopped vessel.

In the last edition of the Pharmacopœia of the United States (1842), it is directed to be prepared as follows: — Take of *Zinc*, in small pieces, ʒiiss.; *Nitric acid*, *Prepared chalk*, each ʒi.; *Muriatic acid*, a sufficient quantity. To the zinc, in a glass or porcelain vessel, add gradually sufficient muriatic acid to dissolve it; then strain, add the nitric acid, and evaporate to dryness. Dissolve the dry mass in water, add the chalk, and, having allowed the mixture to stand for twenty-four hours, filter, and again evaporate to dryness.

Chloride of zinc is very deliquescent in the air, forming *butter of zinc* (*butyrum zinci* German, *Zinkbutter*). It is very soluble in water, alcohol, and ether.

EFFECTS ON THE ECONOMY.

Chloride of zinc has been exhibited both internally and externally, but chiefly in the latter mode, especially in this country.

Papenguth* found a very dilute solution useful in *flabby scrophulous ulcerations*, applied in the form of lotion; and in *sinuous ulcers*, in the form of injection. It has been especially recommended as a caustic, that does not exert any disagreeable influence, like corrosive sublimate, arsenic, or potassa fusa:—never causing violent pain in the affected parts, or any kind of irritative fever; or disordering the digestive organs, as some of the articles just mentioned. Hancke, indeed, advises, that arsenic should be entirely banished from therapeutics as a caustic agent, and that chloride of zinc should be substituted for it. He employed it with success in old, *atonic ulcerations* on the feet, in the strength of two grains to the ounce of distilled water: with this he wetted lint, and applied it two or three times a day. With like success, he used it in *old syphilitic ulcers*, with extremely morbid surfaces and secretions: the chloride destroyed the degenerate formation, and effected cicatrisation. In *scrophulous* and *malignant herpetic ulcers*, he prescribed a concentrated solution; in *pityriasis* he used it as a wash, and in *wounds and ulcerations with fungous formations*, he applied it in a concentrated state; in *phagedenic ulcers of the face*, it effected a more certain cure than the method of Cosme,—the chloride being strewed, a line thick, in a dry state, over the whole surface of the ulcer, the edges surrounded with adhesive plaster, and a plaster placed over the chloride of zinc, with compresses and an appropriate bandage. In *nævi materni, angiectasis, &c.*, he applied it in the same manner, as well as in the *pustule maligne (Milzbrandkarbunkel)*.

Mr. Carmichael† states, however, that he has used it in several instances, and has come to the conclusion, that, although not so objectionable as the arsenious acid, on account of the poisonous nature of the latter, it excites as much pain and inflammation,‡ without destroying, to the same extent, the carcinomatous substance.

By Mr. Guthrie, chloride of zinc has been used in *necrosis*, to penetrate the hardened case of new bone. It attacks the animal tissue of the bone, destroys it, and thus causes the earthy matter to soften and become detached. The sequestrum is by

* Nouveau Journal de Médecine, 1819.

† Dublin Medical Press, March 4, 1840.

‡ See, also, Vogt, Pharmacodynamik, i. 363, 2te Auflage; cited by Pereira, Elements of Mat. Med. i. 821, 2d edit. Lond. 1842.

this means exposed with little pain or disturbance of the part, and may be dealt with according to circumstances.*

Mr. Callaway,† of Guy's Hospital, London, employed it with considerable success in the cure of *cutaneous* and *subcutaneous nævi materni*. It was directed to be rubbed on the part until the skin became slightly discoloured, and to be repeated at intervals. Dr. Alexander Ure has found it extremely useful in the varieties of erosive ulcers called *lupus*, which were often speedily checked, and the disease permanently cured by the local use of the chloride. He applied it in a paste, made with one part of the chloride and two or three parts of the anhydrous sulphate of lime — a modification of Canquoin's formula (see below), recommended some years ago.‡ One or two applications of the paste were generally sufficient to produce a proper eschar, and when this was detached, the sore was treated with water dressing.§ A case is related by Dr. Davidson,|| of *malignant ulcer* under the left ear, which was cured by the unmixed chloride of zinc, applied repeatedly until the ulcer assumed a healthy character.

Hancke used it likewise for the *formation of issues*, which it establishes in from six to eight hours; and, lastly, to excite rubefaction on the surface, either applied in the form of solution of the chloride in water or wine, or mixed with oil or lard into an ointment, and rubbed on the skin: in this way, a gritty kind of eruption of a scarlet hue is induced, which is said to have afforded relief in *paralysis* of the limbs.

Wendt, Vogt, and Canquoin have highly extolled the chloride as a caustic, and it has been largely employed by the physicians and surgeons of this continent, especially in the Philadelphia Hospital, and Pennsylvania Hospital, in similar cases to those mentioned above.

Dr. Davidson¶ is of opinion, that chloride of zinc is only superior to many other caustics in cases where the destruction of a considerable thickness of texture is required, or where the removal of an excrescence by a caustic is preferred by the patient to the knife: the nitrate of silver seems, he considers, to be superior in promoting a sound action, when the unhealthy surface or stratum of the ulcer is superficial.

* James, Retrospective Address before the Provincial Medical Association, in the Transactions of the Association. Lond. 1840.

† British Annals of Medicine, May 19, 1837.

‡ Lond. Med. Gazette, Dec. 19, 1835.

§ Ibid. Dec. 3, 1836. See a case of *noli me tangere* of the nostril, and one of *phagedenic ulcer of the arm*, cured, in London Lancet, cited in Boston Med. and Surg. Journ. Nov. 4, 1840, p. 215.

|| Edinb. Med. and Surg. Journ. Jan. 1838.

¶ Op. cit., and American Journal of the Medical Sciences, May, 1889, p. 238.

Hancke* has, likewise, used the chloride internally, with advantage, in cases of *epilepsy*, as well as in *St. Vitus's dance*; and has prescribed it, united with hydrocyanic acid, in *proso-palgia*. Hufeland, also, extols the solution of the chloride in all those *neuroses* in which the oxide of zinc is indicated, and especially in such patients as are not readily impressible.†

A recent writer, M. Gaudriot,‡ considers, that chloride of zinc properly diluted has a great effect in curing simple *blennorrhœa of the urethra and vagina*. To cure the disease readily in men it is generally sufficient to use the injection given below, thrice a day for two or three days. The first injections are almost always followed by more or less swelling of the glans, but this does not prevent their continuance. In women four or six of the suppositories mentioned below are sufficient to produce a cure. The first generally occasions swelling, with more or less heat of the vulva; but these symptoms soon disappear.

MODE OF ADMINISTERING.

Guttæ zinci chloridi.

Drops of chloride of zinc.

Æther Zinci.

R. Zinci. chlorid. gr. j.

Sp. æther. muriat. seu sulphuric. f.ʒiv. Solve.

Dose. — Five drops, every four hours, in a little sugared water; gradually increasing the dose to ten drops, in *chorea, epilepsy, prosopalgia*, &c. *Hufeland, Hancke.§*

Lotio zinci chloridi.

Lotion of chloride of zinc.

R. Zinc. chlorid. gr. viij.

Ext. aloes aquos. ʒij.

Aquæ destill. f.ʒiv. Solve.

Applied to the dressings, in cases of *atonic, scrophulous ulcers*. *Vogt.*

Or, the aloes may be omitted.

* Rust's Magazine, xxii. 373; and Journal de Pharmacie, xvi. 549.

† See Mérat and De Lens, Art. Zinc (chlorure de).

‡ Journ. des Connaissances Med. Sept. 1840; and Brit. and For. Med. Rev. April, 1841, p. 527.

§ Lincke, Vollständiges Recept-Taschenbuch, u. s. w. ii. 780. Leipz. 1841.

*Injectio zinci chloridi.**Injection of chloride of zinc.*

R. Zinci chlorid. liquid. gtt. xxiv. — xxxvi.
 Aquæ destillat. ℥iv.

Filter through paper. A small quantity of this to be injected about an inch along the urethra, two or three times a day.

Gaudriot.

*Suppositorium zinci chloridi.**Suppository of chloride of zinc.*

R. Zinci chlorid. liquid. gtt. v.
 Morphiæ sulphat. gr. ss.

Mix with three drams of the following paste :

R. Mucilag. tragacanth. p. vj.
 Sacchar. pulv. p. iij.
 Amyli pulv. p. ix.

One of these must be introduced every day, or every other day.

Gaudriot.

Chloride of zinc may be applied as a caustic, by means of a moistened hair pencil, either alone, or mixed with an equal portion of oxide of zinc, or sulphate of lime, or according to the following forms : —

*Pasta zinci chloridi.**Paste of chloride of zinc.**Canquoin's Caustic Pastes.*

	A.	B.	C.
R. Zinci chlorid.	p. i.	i.	i.
Farinæ tritici	p. iv.	ij.	ij.
Aquæ fontan.*	q. s. ut fiat pasta.		
R. Zinci chlorid.	p. j.		
Farinæ tritici	p. iss.		
Butyri antimonii,	p. ss.		
Aq. font.	q. s. ut fiat pasta.		

* To each ounce of the chloride of zinc twenty-four to thirty drops of water may be added.

CXLIII. ZINCI CYANURETUM.

SYNONYMES. Zinci Cyanidum, Zincum Cyanogenatum, Z. Borussicum, Z. Zooticum, Z. Hydrocyanicum, Cyanuretum Zincicum seu Zinci, Cyanetum Zinci, Prussias seu Hydrocyanas seu Cyanhydras Zinci seu Zincicus, Hydrocyanate, Prussiate, or Cyanuret of Zinc.

French. Cyanure de Zinc.

German. Cynzink, Blausaures Zynkoxyd, Blaustoffzink, Zinkeyanüre.

This preparation was used in Germany for a long time before the process was made known.*

METHOD OF PREPARING.

According to Kunze, it is directed, in the Leipzig shops, to be prepared as follows:† — Any quantity of pure *sulphate of zinc* is dissolved in ten times as much *distilled water*; the fluid is then filtered, and decomposed by a solution of *hydrocyanate of potassa*, or *hydrocyanate of lime*; added by drops so long as a precipitate is formed. This precipitate, which consists of cyanuret of zinc, must be carefully washed, dried, and preserved in a glass jar, from which the entrance of light is prevented.‡

It has been admitted into the Parisian "Codex."

Cyanuret of zinc has the appearance of a white, tasteless powder, which is insoluble in water and alcohol, but dissolves in the stronger acids, with the disengagement of hydrocyanic acid. Well prepared and rubbed, it has a strong odour of hydrocyanic acid, and when moistened, or exposed to heat, it gives off hydrocyanic acid.

As to its medicinal effects, and mode of administering, they are analogous to those of the following preparation: they are, therefore given together.

* Magendie, Formulaire pour la Préparation, &c. de plusieurs nouveaux Médicamens, &c.

† Riecke, Die neuern Arzneimittel, u. s. w. S. 410. Stuttgart, 1837.

‡ For M. Pelletier's method, see Magendie, Formulaire, &c.

CXLIV. ZINCI FERROCYANURETUM.

SYNONYMES. Zinci Ferrocyanidum, Z. Ferrohydrocyanas, Cyanetum seu Cyanuretum Zinci et Ferri, Cyanetum Ferrosozincicum, Cyanuretum Ferrozincicum, Zincum Ferrohydrocyanicum, Z. Ferroboreussicum, Z. Ferrocyanogenatum seu Ferrocyanatum, Prussias Zinci et Ferri, Hydrocyanas Zinci Ferruginosus, Ferrohydrocyanas Zinci, Ferrocyanuret, Ferro-hydrocyanate or Ferrocyanate of Zinc.

German. Eisenblausaures Zink, Blausaures Eisenzink, Eisenhaltiges Blausaures Zink, Blausaures Eisenoxydul-Zinkoxyd, Zinkeisencyanüre, Cyanei-senzink.

METHOD OF PREPARING.

According to Schindler,* this preparation is best made by the mutual decomposition of boiling hot solutions of eighty-three parts of *sulphate of zinc*, and sixty parts of *ferrocyanuret of potassium*. If the sulphate of zinc be not entirely free from iron, the salt will have a bluish lustre, which, after long washing with lime water, becomes of a reddish hue. If the bluish colour be manifested, some more sulphate of zinc must be added, and it must be digested until the precipitate appears entirely white.

Ferrocyanuret of zinc forms a white, insoluble, almost inodorous powder, which is somewhat soluble in the stronger acids, without exhaling a smell of hydrocyanic acid in the cold; but by boiling, hydrocyanic acid is slowly disengaged.

EFFECTS ON THE ECONOMY.

Hufeland recommends the cyanuret, or perhaps, the ferrocyanuret of zinc in *nervous diseases*. According to him, from one to four grains may be given for a dose, two or three times a day, without any injurious effects;—the only inconvenience being, at times, slight nausea, but no diarrhœa, or disposition to obstructions, and no narcotic symptoms. In *cardialgia*, it afforded, in his hands, essential service, as well as in some cases of *epilepsy* and in *paralysis*. Henning,† likewise, found it useful in *cramp of the stomach*, in *hysteria*, and in *spasmodic diseases of children induced by worms*. In *epileptic attacks from teething*, he also

* Riecke, Op. cit. S. 411, and 2te Auflage, S. 646. Stuttgart, 1840

† Hufeland's Journal, 1823.

gave it with advantage ; — the dose being from half a grain to a grain, three or four times a day. Clarus gave cyanuret of zinc in *epilepsy*, but he observed no other result than less frequent and less severe attacks. Pohl saw no very decided effect from the remedy, which he gave in the dose of from one-fourth to half a grain. In the Berlin Polyclinic Institute, advantage accrued from it in two cases of *St. Vitus's dance* ; it was begun with in the dose of one-third of a grain twice a day, which was gradually raised to fourteen grains a day. Klokow gave the cyanuret of zinc — which Riecke suggests* was the cyanuret of zinc and potassium, (*Cyanzink-cyankalium*), in *spasmodic affections*, — beginning at first with one-tenth of a grain, — as larger doses occasioned colic, diarrhœa, and vomiting — and, when the patient became accustomed to it, gradually augmenting the dose to half a grain. Success, he affirms, followed its administration.† Muhrbeck gave it, in violent *periodical cephalalgia* in the region of the left frontal sinus, with great benefit. He began with one-twelfth of a grain, and gradually raised the dose to a grain and a half. Müller and Günther confirm the reports of its efficacy in *St. Vitus's dance*: the first gave daily a grain ; the latter, from half a grain to a grain, four times a day.

Kopp, who distinguishes the two preparations from each other, instituted experiments with each. He used the ferrocyanuret of zinc with advantage in *cramp of the stomach, general nervous disorder, nervous debility, neuralgia, nervous headach, and nocturnal pains in the bones*. He gave it in the form of powder, with some sugar of milk, every two hours, or four times a day, in doses of one-twelfth to one-eighth of a grain, gradually increasing them. According to his observations, it occasions, with many persons, obstructions, but does not disorder the stomach. Kopp found the cyanuret of zinc still more efficacious in the same disorders. Incompressible patients, who suffered under unusual sensibility of the abdomen, took four powders daily, of one-sixteenth of a grain each, with marked benefit. In one case of neuralgia, in a man, he elevated the dose very gradually to half a grain, four times a day. When, however, this quantity was exceeded, and the patient took five-eighths of a grain four times a day, hyperæmia occurred in the head, with constipation. In two cases of chorea of one side of the body, the ferrocyanuret had no effect whatever.

Riecke‡ asserts, that his father used it several times with advantage in *scirrhus of the pylorus*.

* Op. cit. S. 413.

† Hufeland und Osann's Journal, B. lxx. St. 2.

‡ Op. cit. S. 414.

MODE OF ADMINISTERING.

The cyanuret was applied externally, by Von Ammon, in scrophulous and incipient rheumatic inflammation of the eyes, as well as in catarrhal inflammation of the eyelids: he prescribed it suspended by means of gum arabic in a mixture of cherry-laurel water, and laudanum.

On account of the insolubility of both the cyanuret and ferrocyanuret, they are best given in the form of pill or powder.

The common dose of the cyanuret is from one-sixteenth to one-twelfth of a grain several times a day, gradually increasing the dose to a quarter of a grain: of the ferrocyanuret, the dose is from one to four grains, two or three times a day. Riecke* advises — to prevent confusion — that when these articles are ordered, they should be respectively denominated *Zincum hydrocyanicum sine ferro*, and *Zincum ferro-hydrocyanicum*.

Pilulæ zinci cyanureti.

Pills of cyanuret of zinc.

R. Zinci cyanur. gr. xv.

Ext. glycyrrh. ℥ij.

Misce et fiant pilulæ lx.

Dose. — One, morning, noon, and night, gradually increasing the quantity. *Kopp.*

R. Zinci cyanuret. gr. vj.

Magnesia, gr. iv.

Cinnam. pulv. gr. iij. Misce.

This dose to be repeated every four hours, in nervous affections of the stomach, especially in cases of cramp. *Henning.*

Mistura zinci ferrocyanureti.

Mixture of ferrocyanuret of zinc.

R. Zinci ferrocyanur. gr. iv.

Aquæ destillat. f. ℥ij. M.

Dose. — A fourth part, four times a day, in *chorea*.

Lincke.†

* Ibid.

† Vollständiges Recept-Taschenbuch, ii. 778. Leipz. 1841.

Pulveres zinci ferrocyanureti.

Powders of ferrocyanuret of zinc.

R. Zinci ferrocyanur. gr. ij. — viij.
 Sacchar. ʒj. M. et divide in part. vj.

Dose. — One to be given every two hours in *cardialgia*.
Von Hildenbrand.

Pilulæ zinci ferrocyanureti.

Pills of ferrocyanuret of zinc.

R. Zinci ferrocyanuret. gr. xv.
 Valerian. rad. pulv. ʒss.
 Extract. valerian. q. s. ut fiant pil. lx.

Dose. — One, morning and evening, in *chorea*.
*Rosensteil and Heckenroth.**

CXLV. ZINCI IO'DIDUM.

SYNONYMES. Zincum Iodatum, Zinci Ioduretum, Iodetum Zinci seu Zinci-
 cum, Protoioduretum Zinci, Iodide, or Ioduret of Zinc.
German. Iodzink, Zinkiodüre.

This preparation is made by boiling together *iodine* and *zinc* in atomic proportions, or rather with an excess of zinc, in a flask of water, to dryness, and subliming the residue. Iodide of zinc is thus procured in beautiful, colourless, prismatic crystals.† It is very deliquescent, and cannot easily be retained in the solid form. When heated in open vessels, it is resolved into iodine and oxide of zinc. It is very liable to undergo spontaneous decomposition.

* Lincke, Op. cit.

† Annales de Chimie, xci.

EFFECTS ON THE ECONOMY.

Iodide of zinc has a caustic taste, and, when applied to a denuded surface, gives rise to considerable smarting. Dr. Ure* recommends an ointment, formed of a dram to an ounce of lard, in cases where the external use of iodide of potassium is indicated. Proutet advises it as a collyrium in *scrophulous ophthalmia*, of the strength of fifteen grains to six ounces of distilled water; and it has been employed to form an astringent injection, in the proportion of one or two grains to an ounce of water.

* Dict. of Chemistry, 2d edition, p. 516.

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- Gastricism (carbo animalis. Mannitum.)
- Gastritis (codeia.)
- Gastrodynia (acid. hydrocyan. Acupunct. Argenti oxidum. Creasoton. Nux vomica. Ol. sinapis.)
- Gastromalacia (acid. acet. empyr. Chlorin. aq.)
- Genital organs, atony of the (cubebæ.)
- Debility of the (cort. adstring. Brazil.)
- Debility of the (nux vomica.)
- Glanders, chronic (creasoton.)
- Glands, enlarged (carbon. sesqui-iodid. plumbi ioidid.)
- Induration of the (hydrarg. deuto-iodur.)
- Mammary, enlarged (veratria.)
- Meibomian, copious secretion from the (calx chlorin.)
- Mesenteric, enlarged (iodinum.)
- Of the neck, inflamed (hydrarg. deuto-iodur.)
- Scrophulous swellings of the (calx chlorin. Chlorin. aq. Iodinum.)
- Submaxillary, enlarged (iodinum.)
- Tumefied, strumous (hydr. protiodid.)
- Glandular affections (aurum muriat. Fuligo. Iodinum. Veratria.)
- Gleet (creasoton. Cubeba. Ergota.)
- Old (tanninum.)
- Goitre (brominum. Calcis chlorid. Hydrarg. deuto-iodur. Iodinum. Potassi bromid. Potass. ioidid.)
- Scirrhus (carbo animalis. Sulphuris carburetum. Veratria.)
- Gonorrhœa (acidum tannicum. Argenti præparat. Auri præpar. Calcis chlorid. Chlorin. aq. Creasoton. Cubebæ. Diosma. Ergota.) See Blennorrhœa.
- Gout (aconit. Acupunct. Ammoniated counter-irritants. Ballota lanata. Colchicum. Compression of arteries. Creasoton. Iodinum. Magnes. Moxa. Ol. croton. Ol. jecinor. aselli. Sulphuris carburetum. Veratria.)
- Atonic (hippocastanum.)
- Chronic (chimaphila. Diosma.)
- Suppressed (ammoniated counter-irritants.)
- Gouty swellings of bones (potass. ioidid.)
- Of the joints (iodinum.)

- Gravel (diosma.)
 White (acid. lact.)
 Growths, morbid (barium iodatum.)
 Gums, scorbutic ulceration of the (creasoton.)
 Gutta rosacea (fuligo. Sulph. iodid.)
 Hæmatemesis (creasoton. Ergota.)
 Hæmaturia (diosma. Ergota.)
 Hæmoptysis (cort. adstring. Brazil. Creasoton. Ergota. Galeopsis. Lactucarium. Monesia. Tannin.)
 Head, determinations to the (chlorin. aq.)
 Headach, intermittent (quinis sulphas.)
 Nervous (strychnia. Ammoniated counter-irritants.) See Cephalalgia.
 Hearing, defective, from otorrhœa (cubebæ.)
 Heart, active diseases of the (aconitia.)
 Enlargement of the (acid. hydrocyanic.)
 Hypertrophy of the (brominum.)
 Hypertrophied (iodin. Potass. bromid. Potass. iodid.)
 Spasmodic affections of the (acid. hydrocyan.)
 Hectic fever (chlorin. aq.)
 Hemierania (acid. hydrocyan. Ferri subcarb. Paullinia.)
 Hemiplegia (nux vomica. Strychnia.)
 Hemorrhage (acid. hydrocyan. Argilla. Cort. adstring. Brazil. Creasoton. Ferr. iodid. Secale cornutum. Acid. tannicum.)
 From arteries of the lower limbs. (Compression of the aorta.)
 Active (acid. hydrocyan.)
 Capillary (creasoton.)
 From the gums (creasoton.)
 From leech-bites (creasoton.)
 From the lungs. See Hæmoptysis.
 Uterine (creasoton. Argenti oxidum. Compression of the aorta. Ferr. iodid. Monesia. Ergota. Ferri citras. Acidum tannicum.)
 Hemorrhoids, inflammation from (Monesia.)
 Hepatic diseases. See Liver Affections.
 Hernia humoralis. See Orchitis.
 Incarcerated (sulphuris carburetum.)
 Herpes (acid. hydrocyan. Calcis chlorin. Chlorin. aq. Creasoton. Ferr. carb. Fuligo. Hydrarg. cyanur. Hydrarg. deuto-iodur. Ol. jecinor. aselli. Potass. bromid. Potass. iodid.)
 Excdens (creasoton.)
 Phagedenic tuberculous (arsenic. iodat.)
 Herpetic ulcers (creasoton.)
 Hiccough, spasmodic (magnes.)
 Hipjoint disease (moxa.)
 Hoarseness (fucus crispus. Ol. tigllii.)
 Hooping-cough (acid. hydrocyan. Emetia. Ferr. subcarb. Ol. tigllii.)
 Hordeolum (hydrarg. iodid. rubr.)
 Hydrocele (acupunct. Electropuncture. Chlorin. Iodinum.)
 Hydrocephalus (iodinum.)
 Hydrocyanic acid, poisoning by (chlorin. Chlorin. aq.)
 Hydrophobia (cannabis indica. Chlorin. aq. Compression of the arteries. Guaco.)
 Hydrothorax (acid. hydrocyan. Colchicum. Iodinum.)
 Hygroma (iodinum.)
 Hyperæmia (ammoniated counter-irritants.) See Inflammation.
 Hyperæsthesia (potassæ chloras.)
 Hyperemesis (tanninum.)
 Hypertrophy (barium-iodatum. Ferr. bromat. Ferr. iodid.)
 Of the coats of the stomach (sulph. carburet.)
 Of the heart (brominum. Iodin. Potass. bromid. Potass. iodid.)
 Of the mammæ (iodinum.)
 Of the spleen (iodin.)
 Of the thymus (iodin.)
 Of the uterus (secale cornutum.)
 Hypochondriasis (auri præparat. Chlorin. Strychnia. Veratria.)
 Hysteralgia (euphorb. ol.)
 Hysteria (Cimicifuga. Creasoton. Fuligo. Granatum. Lactucarium. Strychnia. Veratria. Zinci ferrohydrocyanur.)
 Hysterie croup (creasoton.)
 Fainting (sulphuris carburetum.)
 Convulsions (indigum.)
 Hysterics (ammoniated counter-irritants.)
 Impetigo (acid. hydrocyan. Arsen. iodat. Creasoton. Ol. jecin. aselli.)
 Impotence (cubebæ. Diosma. Iodinum. Nux vomica.)
 Incontinence of urine (iodin. Nux vomica.)
 Indigestion. See Dyspepsia.
 Indurations, glandular, chronic (carbo animalis. Fuligo Hydrarg. deuto-iodid.)
 Of the pancreas (carbo-animalis. Iodin.)
 Chronic (calendula.)
 Chronic, of the mammæ (carbo animalis.)
 Inflammation (acid. hydrocyan. Aconitia. Compression of arteries.)
 Of the absorbents (iodinum.)

- Inflammation — *continued.*
 Of the bursæ (iodinum.)
 Of the bronchia. See Bronchitis.
 Chronic (acid. hydrocyan. Barium iodatum. Ol. croton.)
 Chronic, of the eustachian tube (catheterism.)
 Chronic, of the lungs and stomach (ol. jecor. aselli.)
 Of the mouth and fauces (chlorin. aq.)
 External (compressio.)
 Of the heart. See Carditis.
 Internal (acid. hydrocyan.)
 Of the joints (iodinum.)
 Of the liver (chlorin. aq.)
 Of the lungs (ammoniated counter-irritants.) See Pneumonia.
 Of the mamma (iodinum.)
 Of the pleura (ammoniated counter-irritants.)
 Synovial (compressio.)
 Thoracic (acid. hydrocyan.)
 Of the trachea (ammoniated counter-irritants.)
- Inflammatory diseases (colchicum. Cort. adstring. Brazil. Morphia. Ol. Sinapis.)
- Integuments, lesions of the (creasoton.)
- Intermittent (cetrarina. Chlorin. aq. Cinchonia. Cubeba. Ferr. sub-carb. Matias. Ferr. cyanur. Gentiana chirayita. Hippocastanum. Indigum. Matias. Narcotina. Phloridzina. Piperina. Quinia. Quiniæ et cinchon. tannas. Quiniæ sulphas. Quiniæ sulphas impurus. Resina chinæ præpar. Salicina. Soda chlorin.)
- Intertrigo of children (creasoton.)
- Iodine disease, 379.
- Iodinia, 379.
- Iodism, 379.
- Iodkrankheit, 379.
- Iodosis, 379, 381.
- Iralgia (quiniæ sulphas.)
- Ischias (oleum sinapis. Veratria.)
- Ischuria (colchicum.)
- Itch (calx chlorin. Chlorin. aq. Creasoton. Fuligo. Sapo mollis.)
 Inveterate (Hydrarg. ioid. rubr.)
- Joints, inflamed (iodinum.)
 Anomalous pains of the (iodinum.)
 Chronic inflammation and enlargement of the (iodinum.)
 Swelled (ammoniated counter-irritants. Calx chlorin.)
- Kidneys, diseases of the (diosma.)
- Kriebelkrankheit, 250.
- Labia pudendi, infiltration of (creasoton.)
- Labour, premature, inducing (ergota.)
- Larynx, chronic engorgements of the (iodinum.)
- Leech-bites, hemorrhage from (creasoton.)
- Lepra (arsen. ioid. Auri præparat. Carbon sesqui-iodid. Chlorin. Hyd. et arsen. Ioid. Iodidum ammoniæ. Sulphur. ioid.)
- Leucorrhœa (acid. tannicum. Chlorin. aq. Colchicum. Cort. adstring. Brazil. Creasoton. Gentiana chirayita. Cubebæ. Ergota. Ferr. ioid. Iodinum. Juglans regia. Liq. Ferr. persesquinit. Monesia. Potassii iodo-hydrargyras. Salicina.)
- Lichen leproides (ferr. carbur.)
- Liver, affections of the (potassæ chloras. Berberina. Chlorin. Iodin.)
 Induration of the (hydrarg. deuto-iodid. Iodinum.)
 Inflammation of the (chlorin. aq.)
 Obstruction of the (hydrarg. proto-iodid.)
 Tubercles of the (iodinum.)
- Lumbago (acupunct. Ammoniated counter-irritants. Veratria.)
- Lungs, affections of the (cimicifuga.)
 Gangrene of the (chlorin.)
 and stomach, chronic inflammation of the (Ol. jecor. aselli.)
- Lupus (hydrarg. deuto-iodid. Hyd. et arsen. ioid. Iodinum. Zinci chlorid.)
 Non exedens (sulphur. ioid.)
 Of the ala nasi (ferr. carb. præc.)
 Of the nose (creasoton.)
- Luxations (diosma.)
- Lymphatism (ferr. ioid.)
- Malignant disease (Ferri-citras.)
- Mammary tumour, chronic (iodinum.)
- Mammæ, hypertrophied (iodinum.)
 Inflamed (iodinum.)
- Mastitis (iodinum.)
- Measles (chlorin. aq.)
- Menorrhagia (cort. adstring. Brazil. Ferr. cyanur. Monesia.)
- Mental affections (auri præparat.)
- Metritis (acid. hydrocyan.)
- Metrorrhagia (cort. adstring. Brazil. Monesia.) See Hemorrhage, uterine.
- Miasmata, destroying (calx chlorin.)
- Milzbrandkarbunkel (chlorin. aq. Zinci chlorid.)
- Mortification, mildew, 250.
- Mouth, inflammation of the, chronic (chlorin. aq.)
 Offensive conditions of the (calx chlorin.)
 Ulceration of the (calx chlorin.)
- Mucous membranes, irritability and ten-

- derness of the (Liquor ferri perses-
quinitratis.)
- Nævi materni (zinci chlorid.)
- Nephralgia (chimaphila.)
- Nephritis (acid. hydrocyan.)
- Nervous coughs (tanninum.)
- Diseases (auri præparat. Cort. ad-
string. Brazil. Creasoton. Ferr.
carb. præc. Ferr. cyanur. Fuligo. Io-
dinum. Magnes. Morphina. Morphiæ
acetat. Ol. sinapis. Quiniæ sulphat.
Zinci ferrohydrocyanas. Veratria.)
- Chronic (acid. hydrocyan. Liq. argent.
muriat. ammoniat.)
- Nervous excitement (lactucarium.)
- Neuralgia (acid. hydrocyan. Aconitia.
Acupunctura. Ammoniated counter-
irritants. Compression of arteries.
Creasoton. Delphinia. Electropunct.
Ferr. carb. præc. Ferr. cyanur. Gal-
vanism. Magnes. Morphiæ acetat.
Morphiæ bimeconas. Moxa. Nux
vomica. Ol. sinapis. Potass. cya-
nur. Strychnia. Veratria. Zinci fer-
rohydrocyanur.)
- Of the abdomen (codeia.)
- Faciei (acid. hydrocyan. Artemisia.
Codeia. Potassæ chloras.) See
Tic Douloureux.
- Frontal (galvanism.)
- Of the heart (magnes.)
- Pulmonary (magnes.)
- Neuroses (ol. tigllii.)
- Nipples, excoriated (acid. acet. empyr.)
- Catarrhal (lactucarium.)
- Sore (creasoton.)
- Nodes, gouty (sulphur. carb.)
- Noli me tangere (iodinum. Zinci chlo-
ridum.)
- Noma (chlorin. aq.)
- Odontalgia (ammoniated counter-irri-
tants. Ol. sinapis.) See Toothach.
- Rheumatic (Ol. croton.)
- Odour, offensive (calx chlorin.)
- Œdema (creasoton.)
- Of the feet (acupunct.)
- Œsophagus, stricture of the (iodinum.)
- Offensive evacuations (calx chlorin.)
- Ophthalmia (acid. hydrocyan. Acupunct.
Creasoton.)
- Catarrhal (calx chlorin.)
- Chronic (calx chlorin. Iodinum.)
- Egyptian (tanninum.)
- Neonatorum (calx chlorin.)
- Purulent (calx chlorin. Monesia.)
- Rheumatic (zinci ferrohydrocyan.)
- Scrophulous (auri præparat. Aurum
muriat. Calx chlorin. Potass. iodic.
Quiniæ sulphat.)
- Ophthalmia — *continued.*
- Strumous (fuligo. Ol. jecor. aselli.)
- Tarsi (acid. pyrolign. Creasoton. Hy-
drarg. deuto-iodid. Zinci ferro-
hydrocyanur. Zinci iodidum.)
- Orchitis (compressio. Iodinum.)
- Osteocopi, syphilitic (strychnia.)
- Otalgia (ol. sinapis. Ol. tigllii.)
- Otorrhœa (creasoton. Cubebæ. Potassii
bromid.)
- Ovaries, degenerated (iodin.)
- Dropsy of the (iodin.)
- Inflammation of the (hydrarg. cya-
nur.)
- Ozæna (calx chlorin. Carbo animalis.
Iodinum.)
- Pain, anomalous, of hip and thigh (mor-
phiæ bimeconas.)
- Nervous and muscular (ammoniated
counter-irritants. Moxa.)
- Nocturnal, in the bones (Zinci ferro
hydrocyanas.)
- Severe (acid. hydrocyan.)
- Pains, after (ergota.)
- Palpitations (magnes. Veratria.)
- Pancreas, induration of the (carbo ani-
malis.)
- Paralysis (acupunct. Arnica. Brucia.
Delphinia. Galvanism. Electro-
punct. Iodinum. Nux vomica.
Paullinia. Strychnia. Veratria.
Zinci chlorid. Zinci ferrohydrocy-
anas.)
- Of the bladder (diosma. Ergota. Strych-
nia.)
- Of the upper eyelid (ol. croton.)
- Of the facial nerve (strychnia.)
- Lead (brucia.)
- Partial (nux vomica.)
- Of the rectum (nux vomica.)
- Succeeding to apoplexy (nux vomica.)
- Paralytic debility (ammoniated counter-
irritants.)
- Paraplegia (ergota. Galvanism. Strych-
nia.)
- Paroxysmal diseases (ergota.)
- Parturient efforts, defective (cimicifuga.
Ergota.)
- Pericarditis (ammoniated counter-irri-
tants.)
- Periodical diseases (ergota.)
- Phlebitis (compressio.)
- Phlegmasia (compressio.)
- Phlegmon (iodinum.)
- Phthisis (acid. hydrocyan. Acid. acet.
empyr. Aq. picea. Argilla. Calx
chlorin. Chlorin. Cimicifuga. Crea-
soton. Fucus crispus. Galeopsis.
Iodinum. Matias. Monesia. Ol.

- croton. Ol. jecor. aselli. Paullinia.
Potassæ chloras. Tanninum.)
- Phthisis, cough of (codeia.)
- Mucosa (galeopsis. Iodidum.)
- Pituitosa (chimaphila.)
- Sweats of (boletus laricis.)
- Pica (caincæ radix.)
- Pimples (ammoniated counter-irritants.)
- Pityriasis (hydrarg. et arsen. iodid. Zinci chlorid.)
- Placenta, retention of the (ergota.)
- Plague (chlorin. aq.)
- Prevention of (chlorin. aq.)
- Pleuritis. See Inflammation of the Pleura.
- Pleurodyne (acupunct.)
- Pneumonia (mannitum.)
- Chronic (hydrarg. cyanuret.)
- Poisoning, by arsenic, (ferri oxyd. hydrat.)
- by arseniate of copper (ferri oxidum hydratum.)
- by hydrocyanic acid (chlorin aq.)
- Polypi, cartilaginous (carbo animalis.)
- Mucous (carbo animalis.)
- Uterine (ergota.)
- Porrigo (acid. acet. empyr. Carbon. sesqui-iodid. Fuligo. Ol. jec. aselli. Hydrarg. et arsen. iodid.)
- Favosa (creasoton. Hydrarg. bromid. Iodinum. Potassii bromid.)
- Scrophulous (auri præparat.) See Tinea.
- Prolapsus vaginæ (creasoton.)
- Prosopalgia (ol. sinapis. Potassæ chloras. Veratria. Zinci chlorid.)
- Prostate, diseases of the (diosma.)
- Enlargement of the (carbo animalis. Iodinum.)
- Prostatic discharges (cubeba.)
- Prurigo (colchicum.)
- Senilis (aq. amygd. concentrata.)
- Pruritus pudendi muliebris (calx chlorin.)
- Vulvæ (fuligo.)
- Psora. See Itch.
- Psoriasis (chlorin. Creasoton. Hydrarg. proto-iodid. Hydrarg. et arsen. iodid. Iodidum ammoniæ. Sulphur. iodid.)
- Palmaris (fuligokali.)
- Pulmonary complaints, chronic (iodinum.)
- Pustule maligne (zinci chlorid.)
- Putrefaction, checking (calx chlorin.)
- Putrescency, tendency to (quinæ et cinchonæ tannas.)
- Pyrosis (argenti oxidum. Nux vomica.)
- Rectum, catarrh of the (cort. adstring. Brazil.)
- Remittent fever (ferr. cyanur.)
- Rhagades (ol. jecor. aselli.)
- Rheumatic pains (hydrarg. deuto-iodid.)
- Swellings of the joints (iodinum.)
- Rheumatism (aconite. Acupunct. Ammoniated counter-irritants. Anthrakokali. Ballota lanata. Caincæ radix. Cannabis indica. Chlorin. Cimicifuga. Colchicum. Compressio. Compression of arteries. Creasoton. Delphin. Electropunct. Fuligo. Galvanism. Iodinum. Magnes. Morphicæ acetas. Moxa. Ol. tigllii. Ol. jecinor. aselli. Ol. sinapis. Platinum. Potassæ chloras. Potass. cyanur. Sulphuris carburetum. Veratria.)
- Articular (aconit.)
- Chronic (aconitia. Chimaphila. Cubebæ. Diosma. Fuligo.)
- Rickets (ferr. iodid. Fuligo. Ol. jecor. aselli.)
- Ringworm (ammoniated counter-irritants.)
- Roseola (chlorin aq.)
- St. Vitus's dance (ammoniated counter-irritants. Liq. argent. muriat. ammon. Artemisia. Nux vomica. Zinci chlorid.)
- Salivation, mercurial (calx chlorin.)
- Mercurial (iodinum.)
- Profuse (auri præparat.)
- Sarcomatous tumour of the knee (bromin.)
- Scabies (acid. acet. empyr. Chlorin.)
- Scalds (iodinum.) See Itch.
- Scarlatina (acid. acet. empyr. Calx chlorin. Chlorin. aq. Colchicum.)
- Sciatica (acupunct. Potass. cyanur)
- Gouty (acid. hydrocyan.)
- Rheumatic (acid. hydrocyan.)
- Scirrhus (auri præpar. Ferr. iodid. Potass. iodid.)
- Of the lips (carbo animalis.)
- Of the mammæ (calendula. Carbo animalis. Iodin.)
- Of the prostate (carbo animalis.)
- Of the pylorus (acid. hydrocyan. Auri præparat. Zinci ferrohydrocyanur.)
- Of the stomach (artemisia. Iodin.)
- Of the tongue (auri præparat.)
- Of the uterus (acid. hydrocyan. Auri præpar. Iodin.)
- Scrophula (acid. pyrolign. Anthrakokali. Auri cyanur. Auri præpar. Brominum. Chlorin. Ferr. bromid. Ferr. cyanur. Ferr. iodid. Fucus crispus. Hydrarg. deuto-iodur. Iodinum. Juglans regia. Monesia.

- Ol. jecor. aselli. Potassii bromid. Potass. iodid.)
- Scrophulosis (hydrarg. protoiodid.)
- Scrophulous affections (soda chlorin.)
- Diathesis (carbo animalis.)
- Diseases (barium iodatum.)
- Habit (ferr. cyanur. Aurum mur. natronat.)
- Swellings (calx chlorin. Carbo animalis. Chlorin. aq. Iodid. quiniæ. Iodinum. Plumbi iodid. Potassii bromidum. Potassii iodohydrargyras. Veratria.)
- Swellings of the glands (calx chlorin.)
- Tumefaction of the upper lip (aur. muriat. natronat.)
- Ulcers (potass. iodid. Hyd. et arsen. iodid. Monesia.)
- Scurvy (creasoton.)
- Seasickness (creasoton.)
- Sensibility, unusual, of the abdomen (zinci ferrohydrocyanas.)
- Serpents, bites of (caincæ radix. Guaco.)
- Serpigo (potass. iodid.)
- Sibbens (hydrarg. et arsen. iodid.)
- Sleeplessness (lactucarium. Magnetism, animal. Morphicæ bimeconas.)
- Sloughing, of cellular membrane (acid. acet. empyreum. Iodin.)
- Gangrenous (monesia.)
- Ulcers (calx chlorin.)
- Small-pox (calx chlorin. Chlorin. aq.)
- Sore throat (ammoniated counter-irritants.)
- Sores, sloughing, gangrenous (acid. pyrolign.)
- Syphilitic (hyd. deuto-iodid.)
- Spasmodic diseases (acid. hydrocyan. Acupunct. Colchicum. Indigum. Magnes. Zinci ferrohydrocyanas.)
- erethism (creasoton.)
- Spasms (ammoniated counter-irritants. Magnes.)
- Specks of the cornea (fuligo.)
- Spermatorrhœa (cubeba.)
- Sphacelus (acid. acet. empyr.)
- Spina ventosa (ol. jecor. aselli.)
- Spine, diseases of the (iodinum. Potassii iodohydrargyras.)
- Spleen, diseases of the (potass. bromid.)
- Engorgement of the (quiniæ sulphas.)
- Enlarged (ferri subcarb. Hydrarg. Deuto-iodid. Iodin.)
- Indurated (iodinum.)
- Sprains (creasoton.)
- Violent (ammoniated counter-irritants.)
- Staubasthma (acid. hydrocyan.)
- Stings of wasps (iodinum.)
- Stomacace (iodinum.)
- Stomach, coats of the, hypertrophy of the (sulph. carbur.)
- Irritability of the (argenti oxidum.)
- Irritation of (codeia.)
- Neuropathic disorders of (acid. hydrocyan.)
- Lungs, chronic inflammation of the (ol. jec. aselli.)
- Stomatitis (monesia.)
- Stricture of the Eustachian tube (catheterism.)
- Of the œsophagus (iodin.)
- Of the urethra (iodin.)
- Spasmodic, of the urethra (diosma.)
- Struma varicosa (carbo animalis.)
- Strumous habits (ferri citras.)
- Suffocation, sense of (acid. hydrocyan.)
- Suppuration, profuse (creasoton.)
- Sweating, profuse (boletus laticis. Tannin.)
- Sycosis (hydrarg. et arsen. iodid.)
- Syphilis (argenti præparat. A. et ammon. chlorid. A. oxidum. Auri cyanur. Auri præparat. Aurum muriat. Chlorin. Hydrarg. bromid. Hydrarg. cyanur. Hydrarg. deuto-iodid.)
- Of children (hydrarg. iodid.)
- Secondary (ferr. iodid. Iodinum.)
- With scrophula (potass. iodid. Hydrarg. iodid. rubr.)
- Syphilitic affections (potassæ chloras.)
- Eruptions (ferr. carb. Hyd. et arsen. iodid.)
- Excoriations (aurum metallicum.)
- Excrescences (aurum metallicum. Platinum.)
- Osteocopi (strychnia.)
- Sore throat (hyd. deuto-iodid.)
- Swellings of the bones (potass. iodid.)
- Ulcers (aurum metallicum.)
- Tabes mesenterica (ferr. iodid.)
- Tænia (acid. hydrocyan. Brayera anthelmintica. Creasoton. Euphorb. ol. Filix mas. Granatum. Ol. croton.)
- Tarsi inflamed, chronic (creasoton.)
- Teeth, caries of the (calx chlorin. Monesia.)
- Testes, enlarged (iodinum. Potass. iodid.)
- Scrofulous swelling of the (potassii bromid.)
- Tetanus (acid. hydrocyan. Ammoniated counter-irritants. Colchicum.)
- Traumatic (cannabis indica. Strychnia.)
- Tetter (iodinum.) See Herpes.
- Thoracic inflammation (hydrarg. cyanur.)
- Thymus, hypertrophied (iodin.)
- Tic douloureux (acid. hydrocyan. Aconitia. Ammoniated counter-irritants.)

- Delphinia. Galvanism. Strychnia. Veratria.) See Neuralgia.
 Tinea (calx chlorin. Chlorin aq. Fuligo. Iodid. sulph.)
 Tone, deficient, general (ferri citras.)
 Tongue, induration of the (auri præparat.)
 Malignant ulcers of the (iodinum.)
 Tonsils, enlarged (iodinum.)
 Malignant ulcers of the (iodinum.)
 Toothach (acid. hydrocyan. Acid. acet. empyr. Acupunct. Creasoton. Liq. ferr. persesquinit. Magnes.)
 Rheumatic (sulph. carbur.)
 Tophi, gouty (iodinum.)
 Tormina (artemisia.)
 Tremors (magnes. Strychnia.)
 From mercury (electro. punct.)
 Trismus (ammoniated counter-irritants.)
 Tubercles (iodinum. Ol. jecor. aselli.)
 Of the lung (chlorin. Iodinum.)
 Mesenteric (iodinum.)
 Tubercles, softening of (moxa.)
 Tuberculous eruptions (brominum.)
 Tumours of the bones (auri. præparat.)
 Of the mammæ (ol. jecor. aselli)
 Scrophulous (iodid. quiniæ. Iodinum.)
 Typhoid fever (aq. chlor. Quiniæ sulph.)
 Typhus (calx chlorin. Chlorin. aq. Potassæ chloras. Quiniæ et cinchoniæ tannas. Sodæ chloridum.)
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 Ulceration of the mouth, (calx chlorin.)
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 Ulcers (chlorin. aq. Creasoton. Iodinum. Ol. jecor. aselli. Soda chlorin.)
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 Cancerous (calendula. Chlorin aq. Ferr. sub-carb. Hydrarg. deuto-iodid.)
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 Carious (creasoton.)
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 Fistulous (creasoton.)
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 Foul (fuligo.)
 Fungous (acid. acet. empyr.)
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